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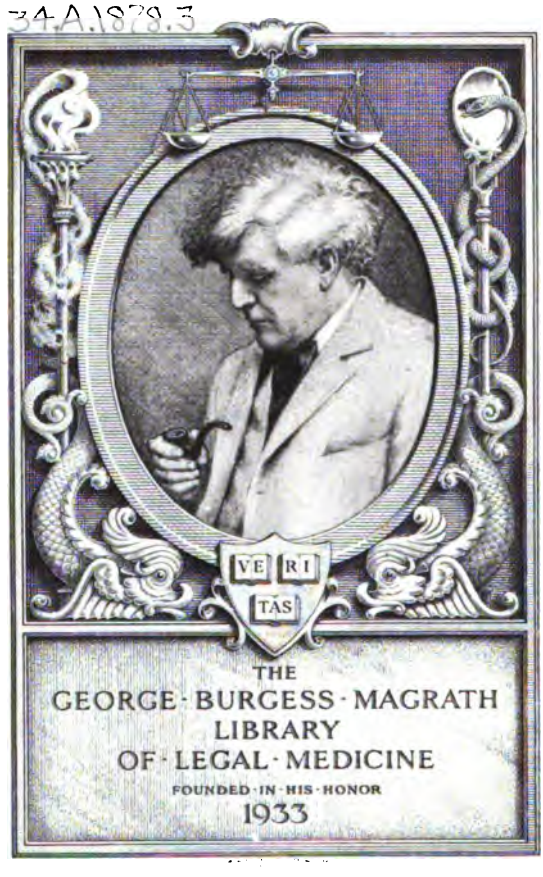

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THE WILLIAMS MURDER TRIAL.[1]

BY H. K. FOSTER, M.D., PEABODY, MASS.,
Medical Examiner.

THE two principal actors in the tragedy known as the Williams murder were, first, John Gallo, an Italian laborer, twenty-four years of age, who had lived in America only a few years, and who could speak English only to a very limited extent, and Alfred C. Williams, the supposed murderer of Gallo. The latter had been employed for about a year at the farm of W. W. Phillips, at Lynnfield Center, as a farm-hand, assisting at the barn in caring for the stock and doing the work of an ordinary farm-laborer in the fields. Williams was a native of Prince Edward's Island, a young man apparently about twenty-five years of age, of medium height, light complexion, athletic figure, clean shaven and altogether in appearance a neat and inoffensive young man, having a large full eye, and a face free from the ugly, dark, vindictive, quarrelsome look often seen on the faces of criminals. He was a man who would impress one as being vain about his personal appearance and achievements. He had been employed at a variety of places in Lynnfield and Wakefield during the year previous to his arrest, and a portion of the time had been employed at the Phillips Farm, and had worked with John Gallo doing work in the fields, and assisting at the stable in caring for the horses, and during the time that he worked on the farm had occupied a room in the upper part of the stable.

On the morning of July 28, 1897, it was reported to me by telephone from Lynnfield Center that there had been a fire at the Phillips Farm and that a small house had been burned and a man had been burned in the house. I drove to Lynnfield as soon as I received the message, arriving there about 10.30 A. M. of the 28th, and while the ruins of the house were still smouldering.

The buildings on the Phillips Farm are situated near the road running from Lynnfield Center to Wakefield, and are not remote from other farm buildings scattered along the same frequented street. They are upon a nearly level tract of land, and consist of a large, old-fashioned, but remodelled farm-house occupied by Mr. Gray, the foreman of the farm, and his family, and members of the Phillips family whenever they choose to come there.

Back of the house there are two large barns, one used for the cattle, and the other barn or stable is used for the horses and carriages, and about ten or fifteen rods still farther back from the stable there was a small, two-room cottage, consisting of a one-story pitch-roof building about ten feet square,

[1] Read before the Society, June 7, 1898.

having a door opening into it on one side, and a window on the opposite side, and on the end of this building toward the stable there was a lean-to about eight feet by ten feet, having a door to enter it from the main room, and one window covered with wire-netting nailed upon the outside of the window-frame. This building was built close to a cart-path which ran back into the cultivated fields. This lane ran from the street at right angles, past the side of the house, straight along by the side of the stable, down past the hut which was burned, and then back into the fields. This lane was fenced upon both sides and the Italian's house formed a portion of the fencing upon one side, and was entered by a door opening directly into it from the lane.

The Italian, Gallo, occupied this hut alone, and did his own cooking, a part of the time upon the cooking-stove in the larger room of the cottage, and a part of the time near the stone wall upon the opposite side of the lane. He slept alone in the lean-to of the cottage and very seldom went away from the farm or had any one come to visit him, worked hard all day, was industrious, quiet and inoffensive in every way, without an enemy in the world, so far as appeared from the trial of the case. He was paid his wages every month at the rate of one dollar and a half per day for every working-day, and always in five-dollar bills as far as possible, Mr. Gray, his employer, drawing the money in five-dollar bills from a bank in Wakefield, upon a check sent him every month by Mr. Phillips. It also appeared during the course of the trial that he had three twenty-dollar gold pieces in his possession when he came to work at the farm; these had been paid him by a contractor at Swampscott for work done while in his employ. These gold pieces and from seventy-five to one hundred dollars in five-dollar bills he was supposed to have had in or about his cottage at the time of the fire.

When I arrived at the scene of the fire there was not a single piece of wood belonging to the hut in sight: all the wooden parts of the building were entirely destroyed. There was no cellar to the building and the stones around the outside of the building, upon which the sills had rested, marked the outside of the ground-floor. The entire surface within these foundation-stones was strewn with hot ashes and about in the centre, from end to end, and on the side farthest away from the lane were the remains of a human being, but so charred, and so nearly consumed, that it required a second examination to satisfy one's self that they were human remains. The head and neck were gone, both arms and both legs were entirely consumed, bones and all. The spinal column and the shrivelled and charred muscles of the back and some of the viscera, charred and contracted beyond recognition, alone were seen.

The remains were given in charge of a Wakefield undertaker and on the following day Dr. J. W. Heath, of Wakefield, and myself looked them over thoroughly. The dorsal and lumbar vertebræ were intact, the deeper muscles of the back were still to be made out, although thoroughly cooked, and covered with charred flesh, and contracted so as to cause marked arching of the spine. The ribs were all gone, except about three inches on each side of the spinal column. The lungs could not be made out at all. The heart, very much

charred, could be seen and the liver and kidneys could be made out; but the other viscera were consumed except the bladder, which contained a small amount of urine; the pelvic bones and sexual organs were entirely gone. All the medical evidence, therefore, that we could furnish in the case was that it was the body of an adult human being.

To return to the scene of the fire: the foundation-stones indicated that there had been a building there, about eighteen or twenty feet long by about eight or ten feet wide, extending parallel with the lane. The spiral springs of a bed were to be seen in the corner nearest the stable and nearest the lane, an iron water-pipe and iron sink were found a little farther along on the side next to the lane, and on the farther end, about half-way from side to side, was the small cooking-stove and the fallen bricks of a chimney. Beyond the bed-springs and near the remains of the body was a tin can such as is generally used for kerosene oil.

At first sight, it would appear as if there was very little evidence in such a case, except of a fire in the night, which destroyed a house and its single occupant; but upon investigation, it appeared:

(1) That the body was consumed to a greater extent than we should expect from the burning of so small a building, the fleshy portions of the thighs and the large bones composing the hip-joints being entirely consumed.

(2) That the occupant of the house was not burned in his bed, as his remains were some feet away from where the bed-springs were to be seen.

(3) That a kerosene-oil can was in the middle of the floor of the bedroom and close beside the body.

(4) That the victim of the burning was not clothed at the time of the burning, as the buckles and buttons of his clothes and some coins and the clasp of a pocket-book were found by the side of the bed-springs and none were found near where the body lay.

(5) That the body lay in the doorway leading out of the bedroom with the head back in the room toward the bed, and not falling forward, as a person would naturally fall if trying to escape from a burning room or building, and it was shown by several witnesses that the fire was first started in the sleeping-room near the bed.

There was quite a group of men standing near the scene of the fire, none of whom were known to me, but apparently they were known to each other, and as I was about to leave the place, after learning what I could about the fire, a young man, who, as I afterwards learned, was Alfred C. Williams, related to the group of men standing there that he was "held up" the night before. He said that he was alone in his room where he was boarding at Wakefield, and, feeling rather uneasy, he lighted a cigar and walked out on the road, near the Wakefield Pond, and while standing there, with one foot upon the rail fence, he was suddenly and without the least warning struck upon the head from behind. He said he thought he had better be doing something to defend himself, so he struck his assailant, the first blow striking him upon the nose, causing it to bleed. The second blow knocked his assailant down; he sprang

upon him, and was getting the best of him when he was struck upon the head by some second person not seen by him before, and was then thrown down a bank several feet near the water's edge. He showed us the bruises upon his head, finger-marks upon the throat, and a great many blood-stains upon his clothing, especially upon the sleeves of his coat. There had evidently been an effort to wash or wipe away most of the blood-stains. One finger had a cut upon it, and he said his assailant chewed that; he had abrasions upon the hands, caused, he said, by striking his assailant. He said that he lay unconscious upon the shore of Wakefield Pond from about midnight until about four o'clock in the morning of July 28th, when he found himself lying with one arm in the water. He then made his way alone to his boarding-place in Wakefield. [The fire in the shanty at Lynnfield was discovered about the same time that Williams said that he came to himself upon the shore of Wakefield Pond, about a mile away.] He went with a companion to the Chief-of-Police of Wakefield, getting him out of his bed, and told him the story of his hold-up, and showed him his bruises. He told the same story to several different persons during the morning, and then started for the scene of the fire at Lynnfield — making two or three calls upon the way. One of his acquaintances, after hearing his story of the hold-up, asked him if he had heard of the fire at Lynnfield, and he replied, "No." His acquaintance then told him that the Italian's hut at Phillips's Farm was burned, and that the Italian was burned in it, and he then asked if he was all burned up.

State-Officer Neal and the Chief-of-Police of Wakefield thought best, upon the evidence, to investigate the alleged "hold-up," and detained Williams at the Wakefield Police Station, and by searching his person they found about seventy-five dollars in five-dollar bills upon his person, and it was shown during the trial that he had spent several dollars that morning, paying back-pay upon his board bill, and making some purchases. It was also shown that upon the previous day, July 27th, he had not money enough to buy a meal, or pay a five-cent fare upon the cars. And upon searching his room at Wakefield, two twenty-dollar gold pieces were found under the carpet in a corner of the room, and a commode was placed over the spot where they were found. Upon being questioned where he obtained the money, he said at first that he received it by registered letter, from his brother, but when he was told by the officer that his brother would not send bills in a registered letter, but would send a check, or post-office order, and that they could find out at the post-office if a registered letter was really sent, he then said that he found it wrapped up in a pocket-handkerchief, lying upon the sidewalk, near the place where he was assaulted.

It was shown during the course of the trial that there were no signs of an encounter, no blood-marks, and no unusual tracks upon the sidewalk where Williams claimed he was assaulted and robbed, and there were no signs upon the shore of the lake that a person had lain there in an unconscious and bleeding condition.

The attorneys for the prosecution argued, from the evidence presented, that Alfred C. Williams was entirely out of money, had no work and was very anxious to get money to pay his bills and to go with some friends to the Klondike. And it appeared that he told his friends that he could get the money. The theory of the Commonwealth was that he left his room at Wakefield on the night of July 27th at about midnight, walked to the Italian's cottage to get the money which he believed was there, that he was discovered and perhaps recognized by Gallo, and in the fight in the dark, as he supposed, for his life, he killed Gallo, probably by stabbing. Then to cover the crime, after he had obtained the money he saturated the body with kerosene oil, left the can beside the body, set fire to the room, and escaped by a back window, as the door was found locked on the inside. He then ran through the fields, where the tracks of a man running could be traced, and came out at the Wakefield Pond about four o'clock in the morning. Here he tried to remove the blood-stains from his clothing by washing. He then thought out the "hold-up" story, left his cap there, walked to his boarding-house, where he appeared shortly after four o'clock, hot, flushed and sweaty, as a man would after such a lively run, and not weak, pale, haggard and sick, as a man would after lying unconscious by the roadside for four hours from a blow upon the head.

The principal arguments for the defence were:

(1) That it could not be proved that John Gallo was really dead or that the charred remains were not, or might not be, the remains of some other person.

(2) That there was no evidence to show that Gallo was killed before the burning occurred, granting that the remains found were actually his.

(3) That Williams was not located near the scene of the fire at any time during the night.

As a closing argument at the end of a trial which lasted four days, the Attorney-General drew a most vivid and convincing picture of the whole transaction, and, after a short conference, the jury brought in a verdict of murder in the first degree, which was, I believe, in accordance with the evidence, and with the almost unanimous opinion of those who heard the evidence.

Many lawyers claimed that it would be very difficult to convict on account of the body being so nearly destroyed, that the manner and the cause of death could not be made out.

A CASE OF CEPHALIC TETANUS.[1]

BY GARRY DE N. HOUGH, M.D., NEW BEDFORD.

On November 19, 1897, Charles Dunham was struck a blow on the nose by John Bryden. The blow made a small wound which bled quite profusely. The bleeding was checked by pressure with a dirty handkerchief.

On November 26th a physician was called for the first time, the complaint being stiffness of the jaws. Next morning the patient was sent to the hospital.

The symptoms were: trismus, inability to articulate, inability to swallow, tetanic contractions of the muscles of the neck, a few convulsions, fever, rapid and weak pulse, death. The noteworthy feature was the limitation of the tetanic symptoms to the head and neck.

On the bridge of the nose was a foul ulcer about the size of a five-cent piece, partially covered by a scab. Cultures were made from the pus under this scab, but nothing resembling tetanus bacilli was found.

When I examined the body I found, besides the ulcer on the nose, a very recently cicatrized wound about one inch long on the dorsum of the left forearm (to a part of which a scab was still adherent), and on the left great toe a tiny ulcer, due to an ingrowing nail (perhaps an eighth of an inch in diameter).

Internally I found: some congestion of the pia mater, hypostatic congestion of the lungs, parenchymatous degeneration of the heart muscle, a somewhat enlarged and softened spleen, congested kidneys, and otherwise normal organs.

Death took place on November 28th, autopsy on the 30th.

Bryden was indicted for manslaughter. I held that it was not yet established as a scientific fact that the form of tetanus called "cephalic" was necessarily the result of infection through a wound situated in the region of distribution of the fifth nerve and that, therefore, since two other recent solutions of continuity existed in the body, it could not be made out that the blow on the nose was the cause of death.

My opinion, of course, was founded on the literature accessible to me. Was this opinion, in the judgment of the Society, justifiable?

[1] Read before the Society, October 5, 1898.

THE MEDICO-LEGAL SIGNIFICANCE OF THE PRESENCE OF SUGAR AND GLYCOGEN IN THE LIVER POST MORTEM.[1]

BY W. K. BROWN, M.D., AND WYATT JOHNSTON, M.D., MONTREAL.

In 1897 Lacassagne and Martin, of Lyons,[2] reported the results of two hundred cases which were tested as to the presence of sugar and glycogen in the liver at the autopsy. Their observations were made with a view of investigating the statement of the late Claude Bernard,[3] that the livers of persons dying sudden or violent deaths contained sugar or glycogen, and usually both, while these substances were said to be absent from the livers of persons dying of disease.

Until the subject has recently been re-studied and a practical method of performing the test was discovered by Lacassagne there were practically no observations, except some made in his laboratory by his pupils Colrab and Fochier in 1888, and Colonel in 1893. The technique recommended is to make an emulsion of the liver-substance (usually 100 grammes), by rubbing it up with water, boiling this in a porcelain capsule, filtering with animal charcoal, and testing the filtrate by Fehling's solution. If glycogen was present the fluid was opalescent. We find that smaller amounts of liver-substance suffice, and that the use of charcoal is hardly necessary.

Lacassagne and Martin recognized the medico-legal value of a test of this kind in deciding such difficult points as whether the injuries received by a person suffering from some serious disease are the immediate cause of death or not. They state that, in the main, their results are strongly confirmatory of the statements of Bernard, though they reserve for the present their opinion as to its significance in poisoning cases. They find that dead-born syphilitic children give a negative reaction, and children live-born or dying during parturition positive ones. On these points we have confirmed their observations.

As the matter seemed to us of practical importance we have made observations on a series of one hundred unselected cases, obtained from the coroners' court and hospital service, and about equally divided between violent and natural deaths. We wish here only to summarize the results obtained, and it is the intention of one of us[4] to report the observations more fully in a subsequent paper. The number of cases studied we do not regard as sufficiently large to serve as a basis for exact statistics. Our results were typical in eighty-eight cases and atypical in twelve.

[1] Read at a meeting of the Society, October 5, 1898.
[2] Archives d'Anthropologie Criminelle, 1897, p. 446.
[3] Thesis de Faculté des Sciences, 1853.
[4] W. K. B.

(*a*) RESULTS IN CASES DYING FROM DISEASE.

Sugar and glycogen were found absent from the livers of those dying from disease except in two cases, in one of which cerebral hemorrhage and in the other brain abscess suddenly terminated the lives of persons apparently in fair health. One case of fatal gastric hemorrhage in hepatic cirrhosis gave a negative test, however. In cases of sepsis, of even a few hours' duration, the result of the reaction was always negative. In an elderly person dying of exhaustion ten days after the receipt of severe burns sugar and glycogen were also absent. A negative result was obtained in a case of puerperal eclampsia fatal in twenty-four hours. A negative result was obtained in a case of diabetes dying from septic infection following gangrene.

(*b*) RESULTS IN CASES DYING FROM VIOLENCE.

Where the death was sudden and affected persons in vigorous health, sugar and glycogen were always present, provided that the processes of alimentation were proceeding in the ordinary manner. On the other hand, in three cases where death resulted within forty-eight hours of injuries (cut throat, fracture of vertebræ, fracture of the base of skull) the result was negative; in the last-named case there was a moderate catarrhal jaundice, from which the patient was convalescing, and the lungs showed traces of commencing aspiration pneumonia. In two cases where death was immediate and due to fracture of the skull, the liver showed neither sugar nor glycogen. In both of these cases there was evidence, both post-mortem and clinical, of acute alcoholism, while there appeared to be no food in the stomach or upper intestine, and in one of them scarcely any feces was found in any part of the intestines. Here it appeared that the individuals had been indulging in a long spree, and, as is common in such cases, had taken little or no food. In another case, where death occurred in the course of an attack of delirium tremens, a negative test was obtained. We think that this point is one on which further information is important, in view of the frequency with which an excessive use of alcohol forms an incident in the circumstances in deaths calling for medico-legal examination.

A case of suicide by carbolic acid also gave negative results to the test. Here, as the man was found dead locked in his room, we had no clear account of the conditions affecting alimentation, but it was stated that his habits were intemperate and that he had recently been drinking heavily. The autopsy did not show that food had recently been ingested.

In two cases of drowning, where the bodies were in an advanced state of decomposition, the test gave negative results; in two others the test was positive.

CONCLUSIONS.

We can confirm the results of previous investigators as regards the result of the test in healthy persons living under normal conditions of nutrition. From our experience so far we are inclined to regard the test as one of very con-

siderable value where the conditions relative to alimentation previous to death can be established through the history or by the results of the post-mortem. It should be borne in mind that the information as regards the cause of death is indirect and that the direct information relates only to the glycogenic function of the liver. We wish to emphasize the important influence of sepsis and of alcoholism with abstention from food; when these are excluded we find the results very constant.

TWO CASES OF SUDDEN DEATH IN INFANTS.[1]

BY OLIVER H. HOWE, M.D., COHASSET, MASS.,
Medical Examiner.

CASE I. On the morning of May 31, 1894, I was called to view the body of M. G. A., a female infant about three months old. The child had been well until the previous evening, when, as stated by the mother, it began to have a tight cough with some wheezing and difficulty of breathing. These symptoms caused great restlessness during the early part of the night, but household remedies were applied by the parents and at length at about 3.30 A. M. the child got comfortably asleep, the mother also lying down to sleep upon the opposite side of the bed.

When the mother awoke at about 5.30 A. M. she found the child dead with its face buried in the pillow, upon which it was lying.

I viewed the body at about 9.30 A. M., and found the hands tightly clenched, the lips purple and froth in the right nostril. The larynx was unobstructed and there were no marks of violence upon the body. The pillow, upon which the child's head had been lying, was of feathers and unusually soft and flimsy. The pillow could be pressed or moulded by the hands and would retain whatever shape was thus given to it.

I considered that the child turned over in its sleep (the mother said it had a particular habit of throwing its head about), and that it became suffocated by the pillow, a process that would have been favored by the obstructed condition of the bronchial tubes.

CASE II. On the morning of January 6, 1895, I was called to view the body of J. F. A., a male child three months old. The parents testified that the child had previously been well with the exception of occasional attacks of colicky pain at night. On the night in question, however, the child had no pain, but had been quietly sleeping through the evening in its cradle. When the parents retired the child was transferred from the cradle to the bed occupied by his parents. The child was placed on the farther side, next the wall; the mother lay in the middle at the right of the child and the father on the outer side of the bed. The mother said that her position before going to sleep was a considerable distance away from the child and that on waking up she was in the same position. She slept continuously until morning, as did also the father. On waking, they found the child dead, its face unencumbered by bed-clothing or pillow. The people in the other half of the house said that they heard the child crying at about 3 A. M. and that the crying suddenly stopped.

Read before the Society, October 5, 1898.

When viewed by me at about 9 A. M. I found large areas of ecchymosis on the right side of the abdomen and of the chest and upon the right thigh and leg. The hands were tightly clenched. The autopsy showed very numerous punctate hemorrhages on the surface and in the substance of both lungs, also over the surface of the heart, the aorta and the right kidney. The hemorrhages were much more marked in the organs on the right side of the body and the right side of the heart. The left kidney and the intestines were normal. The brain was also normal.

The shape and location of the external areas of ecchymosis, together with the punctate hemorrhages revealed by the autopsy, made it clear that the child's death had been caused by the pressure of the mother's body, making it a case of "overlaying." Although she stated that when she awoke she was some distance from the child, it is fair to believe that during sleep she rolled upon the child and remained upon it long enough to destroy its life and then perhaps in another unconscious movement rolled away from it again. Both parents had great fondness for their children and grieved deeply over this unfortunate event.

THE MURDER OF JOHN DEAN — A MEDICO-LEGAL REVIEW.[1]

BY E. G. HOITT, M.D., MARLBOROUGH,
Medical Examiner.

THE victim of the murder was John Dean, of Maynard, Mass., a well-to-do farmer, seventy-five years of age. He resided one mile north from the village of Maynard, on the Acton road. He was well known in his locality, having resided there for many years; he was a widower. The remaining members of his family consisted of two unmarried daughters, the three living cosily and happily at their home. One of the daughters was by occupation a milliner in Maynard, the other was employed as book-keeper in the same place. Owing to the fact that the daughters were thus engaged during the day, the father spent most of his time alone on the farm.

The house is about twenty-five feet from the road. At the time of the murder there was snow on the ground. The old man's work consisted largely of chopping wood, between his house and barn, a short distance from the house. In the afternoon of December 17, 1896, at four o'clock, he was seen chopping wood at the place mentioned. At five o'clock a teamster in passing saw him coming from the barn towards the back door of the house, having in his right hand a tin milk-pail. I learned it was his custom to do his milking at about that hour.

His daughters returned home that evening at eight-thirty o'clock. Finding no light in the house, one of them entered the kitchen for a lamp; on striking a light, she discovered the mutilated dead body of her father lying on the floor, near the outside door. She gave the alarm to her sister, when the two rushed from the house, going to a neighbor's a short distance away, making them acquainted with the facts.

The neighbor went to the Dean house and finding the old man in the condition described by the daughters summoned the family physician, who responded to the call. In his examination of the wounds of the dead man he drew the body down from the door about six inches. After making this examination, and without washing his hands, he examined the pockets of the deceased, to ascertain if he had been robbed, as he was known by the daughters to have had quite a sum of money on his person.

A bloody axe stood against the wall in close proximity to the body, which was also examined by the physician.

The local police of the village were now summoned, arriving at ten o'clock. At eleven o'clock of the same date I was summoned by telephone by the police. As no trains were running at that hour, and the highways were nearly impass-

[1] Read at the meeting of the Society, February 1, 1899.

able by reason of heavy snowfall, I ordered the police to guard the body, house and surroundings, allow no person to enter the house, and nothing to be disturbed until my arrival, which would be at an early hour the following morning.

I viewed the body the following morning, December 18th, at seven o'clock, learning the following facts:

The body was identified by witnesses as being that of John Dean. Because of his having no enemies there seemed no apparent reason for his being foully dealt with, other than for mercenary reasons.

I found the body lying on the back, left arm extended by side, right arm at right angles with body. Near the right hand lay a partially overturned tin milk-pail, spattered with blood, containing about a pint of milk. His cap which he had on when seen by the teamster at five o'clock lay on the right side of the body near the elbow. He was dressed in brown cotton working jacket or jumper, a dark brown vest, dark pantaloons striped with gray, a gray flannel outside shirt and blue ribbed undershirt, felt boots covered with rubber overshoes, blue woollen stockings, and brown underdrawers.

All garments on the body above the waist line were saturated with blood. Spots of blood were also found on pants. There were a few blood spots on tops of overshoes and none on soles. His head was lying one and one-half feet from the outside door. A pool of blood was around his head and shoulders and extended down to the gluteal region on the left side of body. The wall on the south side of the room was spattered with blood, also inside of the outside door. The tablecloth, table-legs and chair standing near showed blood spots.

After a superficial examination of the body, taking careful notes relative to the same, also of the room and surroundings, I summoned a photographer, who furnished me with pictures, which were afterwards presented in court as evidence, and which I am pleased to show you at this time.

I made an autopsy in the presence of the required witnesses. I found the left parietal bone fractured and depressed near its articulation with the frontal bone. The integument was ecchymosed, unbroken and depressed over the line of the fracture. The depression extended backwards and measured one inch wide and three inches long. An incised wound, caused by some sharp instrument, entered the right side of the mouth, and in its passage backwards and upwards severed the tongue, dislodged the anterior molars, cut off the alveolar process of the superior maxillary on the left side, disarticulated the inferior maxillary, severed the left carotid and all the muscular tissue through the body of the fifth cervical vertebra and all the tissue and integument on the back of the neck. A second incised wound, on the right side of the face, extending from the angle of the inferior maxillary to the symphysis, cut off the inferior border of the inferior maxillary, and severed all in its passage to the clavicle, near its articulation with the sternum. The right hand and wrist, though uninjured, were covered with blood. The middle finger of the left hand was nearly severed at the second articulation. The brain showed no

indication of having been injured. All thoracic and abdominal organs appeared to be normal.

The stomach contained four ounces of light brown liquid, with small particles of undigested food. This organ with its contents was sealed and sent to Dr. Edward S. Wood for examination. I also sent all wearing apparel, the milk-pail and the axe, which was marked in the presence of witnesses.

I gave the body in charge of the undertaker, to be placed in the tomb for further examination, should future occasion demand it.

Now let us turn from this horrible deed to the perpetrator. Lorenzo Barnes was a man thirty-five years of age, height six feet, weight one hundred and seventy-six pounds, single, by occupation laborer, and of intemperate habits. His widowed mother and sister resided in Marlboro'. Barnes was of a roving disposition, and had no desire to remain at home with his people, choosing to make his home elsewhere, giving Maynard the preference. He had no regular boarding-place, obtained his meals wherever and whenever he could, slept in barns, sheds or any place which might form a covering. He appeared to be of a good disposition, and faithfully discharged any duty in which he might be employed, his only failing being an over-indulgence in intoxicating liquors. In his general appearance there was nothing indicative of the criminal. He was a frequent caller at the Dean home, and was often employed there.

Barnes's conduct after the murder was such as to cause comment and excite suspicion, from the fact that during the evening he called at a neighbor's near the Dean house and asked permission to wash blood from his hands, said he had been assisting in butchering a pig. During that evening and the following day he appeared in better clothes, had plenty of money, the bills being of larger denomination than those usually in his possession. He visited several saloons, spending money freely there.

The morning following, while in a saloon, the account of the murder was read aloud from the morning paper by the proprietor. Barnes appeared to be much interested and requested that he again read it, which he did. Barnes made no comments and seemingly remained unmoved.

The above facts justified the advisability of his arrest, which was accomplished. The officers having him in charge were rewarded in their examination by finding bills, receipts and other papers which were the property of John Dean, and known to have been on his person the morning preceding his death.

The clothes worn by Barnes on the night of the murder were spotted with blood. They were placed in the hands of the State officers, who subsequently transferred them to the charge of Dr. E. S. Wood.

Previous to the execution of Barnes he made a confession that he killed John Dean, but did not state the manner in which he killed him.

From observations and facts gained in the autopsy, I was led to the following conclusions: It was the usual custom of John Dean to do his milking at five o'clock in the afternoon. A teamster in passing the house at that hour

saw Dean coming from the barn toward the house with a tin milk-pail in his right hand, and nothing in his left. The body being found by his daughter at eight-thirty o'clock, I am of the opinion that he was killed at five o'clock, upon his entrance at the door; that while he was milking the murderer secreted himself within the house in front of the door and awaited the arrival of his victim.

Owing to the fact of there being no blood on the outside of the door, door-jamb or outside steps, I am satisfied that the door was closed before the fatal blows were struck. Because of the indentations in the cap worn by Dean, the ecchymosed skin and fractured skull, which corresponded to the poll of the bloody axe found against the wall in close proximity to the body, I am of the opinion that he was struck on the head with the poll or back of the axe, which caused him to fall backwards with his head towards the door.

The blood on the inside of the door and on the wall, the direction of the blood spots on the milk-pail, cap and other articles about the body, the direction of the wounds on the face and neck, the cuts in the collar of his jumper, all made it very apparent to me that the body was in dorsal position when the chopping took place. Blood stains were found in the pockets of Mr. Dean's clothing, which showed they had been rifled by bloody hands. The four bloody-finger imprints on the part of the axe known as the belly of the handle led me to believe that the prints were made by the fingers of the right hand. This being the case, it gave me positive proof of the murderer's position in the room, his manner of handling the axe, and also satisfied me that he stood on the left side of his victim while doing the chopping.

A few days after my examination it occurred to me that the axe having passed through the neck and collar of the jumper, the blade must have entered the floor. I made State Officer Whitney acquainted with my opinion. He at once examined the floor, found the marks and removed the boards, which were produced in court as evidence.

Barnes was indicted at the February term of the court in 1897; the trial opened in Lowell on May 3d following. The verdict of murder in the first degree was returned on May 7th. The State was ably represented by District Attorney Weir and Assistant District Attorney Geo. A. Sanderson. At the request of District Attorney Weir, I prepared a model of the head and neck of Mr. Dean, which showed the wounds; I also had drawings of the same. When asked by the prosecution to place the model on the floor in a position corresponding to that in which I first saw the body counsel for the defence objected, on the ground that the body had been moved six inches from its original position by the physician first called. The State's evidence was also weakened by the fact that this same physician examined the pockets after having examined the wounds. The point of the objection raised was a question as to who conveyed that blood to the pockets, — whether it was done by the murderer or the physician. Another point of objection raised was the question as to who was responsible for the bloody-finger imprints on the handle of the axe.

The defence tried to prove the insanity of Barnes, with negative results.

The criminal was placed upon the stand and testified that he called at the Dean house on the night of the murder at about six o'clock, that there was no light in the kitchen, and in his attempt to open the outside door it struck against the body of Dean; also that he found two men there and he grappled with one of them and that the other one ran out. When asked by the State in what part of the room this struggle took place he answered, "on the left side of the murdered man." The distance from Mr. Dean's left to the wall was two feet six inches. A pool of coagulated blood extended from the neck to the gluteal region and out from the body towards the wall six inches, leaving a clean floor space of two feet. I was asked by the State if I saw any evidence of the blood having been disturbed, and if in my opinion two men could tussle without the aid of a light, in a space of two feet six inches, without disturbing the coagulated blood.

Barnes was executed only after every means to secure a commutation of his sentence had been tried, both in the courts and before the Governor, with negative results. On the scaffold he was calm in every respect. When he stepped from his cell his gait was steady. He looked down over the official witnesses as if endeavoring to scan some familiar faces. He watched the process of binding his limbs with apparently as much calmness as though he was being measured for a pair of trousers. To me, he appeared to exercise a greater degree of self-control than did any of the witnesses present.

DISCUSSION.

DR. E. S. WOOD: Mr. President, I have very little to say in regard to the blood stains; of course that is the point on which I am asked to discuss the case. I received from the State officer all of the clothing belonging to the defendant, Barnes, which appeared to have any blood stains upon it, and the important part of the blood work consisted in the detection of many of the blood stains. It was alleged by Barnes that the blood on his clothing came from himself in the tussle with his supposed assailants; but the direction of many of the stains showed that this was absolutely impossible, and that they were thoroughly consistent with the stains coming from the head of the victim, as it lay upon the floor of the room, as shown in the photographs. There is one point in regard to the photographs which Dr. Hoitt did not lay stress upon, and that is the mark on the sideboard, showing where the head struck the sideboard and made a different kind of a stain, on account of brushing marks of the clotted hair.

Barnes's rubber boots were brought to me at the time; these he had replaced on the evening of the murder with a new pair, and had thrown the old pair over the bridge, supposedly into the river; but it so happened that the river was frozen and the blood stains on the boots were not washed off, so they were intact when handed to me. On the right rubber boot there were eight quite large spatters. One important one was on the inside of the leg of the boot, eight inches from the top, and over one inch long, and had a direction

from the front backward, showing it had been probably against the inside of the upper surface of the right foot from a point nearly at the same level as the middle of the boot leg, and it was at a point eight inches from the top of the ordinary rubber boot. There were seven other spatters upon the boot, and I counted small spatters on the front of the leg, mostly on the inside, and some showing a direction from above downward, others showing a direction downward and backward, and others directly backward, as though some of the blood struck the boots as it was falling over directly against the boots on a level. On the left boot there were not so many, although there were a great many blood stains on the front, and particularly about the instep on the inside and on the outer instep. The trousers had three stains upon the right leg, not of any great importance. One was a rubbed stain, which occupied a position corresponding to the one at the top of the rubber boot which had a rubbed stain upon it. The left leg had two stains upon it, not of any very great importance. The jacket, of brown mackintosh cloth, had three stains on the right sleeve, and on the left front two stains, and on the left sleeve four spatters, one up near the shoulder, the other three down near the edge of the sleeve.

I would state in reference to all of the blood stains examined, in order to determine the question as to its human or animal origin, that the diameter of the red blood stains averaged between $\frac{1}{3200}$ and $\frac{1}{3300}$ of an inch, and therefore was consistent with the belief that it was made by human blood — and that was not disputed, as the prisoner stated that the blood came from himself in the struggle.

There was another blood-stained object that was of a good deal of importance, and that was a milk-pail which had fallen somewhere near the victim, and it left spatters both upon the inside of the cover (that is, the half-cover of a milk-pail), and the spatters were in such a position that it would have been absolutely impossible for the blood to have come from Barnes in any struggle with the alleged assailants. That was one of the principal items in his defence — that the blood stains came from his nose-bleed, or from himself, in his struggle; there was no wound upon him, therefore the only place from which he could have bled was the nose, and the direction of the stain on his boots showed that they could not come from his nose-bleed; also, the direction of the stains on the milk-pail showed that the stains came from the direction of the head of the victim, in the position that the milk-pail was upon the floor, and not in a position to come from one struggling near the place.

There is one other thing which I forgot, Mr. President, and that is in reference to the finger-print marks on the axe-handle; I did not think of it when speaking, because the investigation is not complete. If I had thought of it I would have brought a most excellent photograph of the prints upon the axe-handle. I have not had the time to work it up as to whether these were the finger prints of Barnes or not. I have some excellent photographs of every print of Barnes's fingers, and think I shall be able to compare with each finger the prints that were made on the axe-handle. This subject is still being worked up, though the case, so far as the law is concerned, is ended.

A CASE OF DOUBLE HOMICIDE: ITS MYSTERY.[1]

REPORTED BY O. J. BROWN, M.D., NORTH ADAMS,
Medical Examiner.

AUGUST 7, 1897, about 12 o'clock, noon, I received notification of a probable homicide at No. 10 Webster Avenue, a narrow alley off Holden Street, North Adams, a locality thickly populated, near the centre of the city. Arriving inside the house at 12.15 P.M., I found two deputy sheriffs, the chief of police, four patrolmen, and several physicians and newspaper reporters. The officers had excluded all others. Several hundred people stood outside in apparent awe and excitement. The house measured 37½ x 16½ feet and a small ell extended it to the rear; it was old, and one story high; it had five rooms, a pantry and a closet on first floor, three rooms and a small closet on the second floor.

Upon request, two physicians (selected for official witnesses) and four officers remained with me inside; all others were excluded. We found the interior of the dwelling in the utmost disorder; everything had been left exactly as found, awaiting my arrival. Upon the bed in a room, 9½ x 10 feet 4 inches, off the kitchen, lay the body of Henry F. R., aged fifty-five, a bachelor, a powerful, muscular man, 5 feet 11 inches tall, weighing about 230 pounds. Rigor mortis was strongly marked. There was still some warmth in the body, in the abdominal region. The body lay on its back, the head to the north, nearest to the right-hand side of the bed and near the door into the kitchen. It was covered in a careless manner, first by a cotton sheet, then a woollen blanket and a bedquilt, while on top lay two white bedspreads folded into sixteen thicknesses. The head was covered with a pillow, which with its pillow-case was saturated with blood on its under surface where it touched the head. This pillow was covered by the bedquilt. The head rested on a pillow at the end nearest the centre of the bed, in a pool of blood. A portion of the sheet was stained with blood. The body was clothed in a gauze undershirt and an ordinary white bosomed shirt, with its right sleeve unbuttoned at the wrist. The arms lay with the forearms flexed enough to bring the hands to a level with the umbilicus. The hands were six inches apart and rested on the abdomen. The fingers of the left hand were slightly flexed, while those of the right hand were closed tightly upon and grasping the quilt over the body. The first finger of the right hand was spattered with blood. The left thigh was flexed at an angle of about 45°. The leg was flexed at a right angle to the thigh and the whole limb was slightly inverted, bringing the knee nine inches from the right side of the bed. The right leg was nearly extended. The foot protruded six

Read before the Society, February 1, 1899.

inches from the side of the bed, and was uncovered. The position of the limbs was that of a person starting to get out of bed.

The general expression of the face was one of horror. In the mouth was a gag, made of heavy canvas sacking, so forcibly crammed in that I extracted it with some difficulty. There was a slight blood stain upon the gag; after its removal the mouth remained widely open.

Upon turning the body on to its left side blood oozed from the mouth, the left ear and the nostril. Underneath there was a sheet, a thin bedquilt, light mattress and a wire spring. The blood had soaked through these to the wire spring. There were evidences of urine upon the thighs and bed-clothing. There was a blood-spatter 10 x 4 inches on the headboard, about six inches from where the head lay. Its appearance indicated that it came from an artery spurting.

Autopsy, August 7th, at 6 o'clock P. M.

External Examination. — Directly over, around and upon the right eye was a crushing injury, that is, a contused wound of nearly circular outline. Through the upper portion of the right eyebrow it gaped a little, and for the distance of one inch extended to the bone. Below the right eye the skin was also broken through. The right malar bone was fractured. There was a contused wound over and around the left eye, very similar to that over the right, but giving the circular outline in more marked degree, and not breaking through the skin to any great extent.

On the left side of the head one and one-half inches above the left eyebrow was a wound one inch long, with ragged edges, in depth extending to the bone. At an acute angle with this wound, and nearer the median line, was another, one inch long, very similar to the one last described, penetrating to the bone.

Just back of the left ear was a crushed condition of the scalp and above this, on the left parietal region, was still another contusion, also penetrating to the skull. This wound was three inches above the left ear, and was one and one-half inches long. The left malar bone was fractured.

Internal Examination. — Upon removing the scalp considerable clotted blood was found directly beneath the two wounds just described as being at an acute angle to each other. At this same place the bone was denuded over a portion the size of a nickel. There was also a fracture here, causing a slight indentation. Upon removal of the calvaria (which was unusually thin) the dura was found congested and dotted with blood. The whole lower half of the left hemisphere was covered with clots. The same condition existed on the right side, but to a more marked degree.

Upon removal of the brain six drachms of soft clots and fluid blood were found in the base of the skull. Fractures had detached the upper portion of both orbits.

There was an extensive fracture extending through the base of the skull in the left middle fossa. Three inches above the left ear I found still another *small* fracture.

There was some hypostatic congestion of the lungs. The heart was normal; both the right and left sides of the heart were empty; the valves were normal. The pleuræ were normal.

There was a thick layer of fat over the abdominal organs. There was still some animal heat in the abdomen. The stomach contained about eight fluid ounces of partly digested food, of semi-solid consistency, made up of potato, meat fibres and cucumber seeds; this food had been in the stomach at least four hours before death, and probably longer. The stomach was healthy, and the kidneys, liver, spleen, pancreas, intestines and all the other organs were normal. The bladder contained about two fluid ounces of urine.

The cause of death was crushing injuries to the head.

We found another victim of the tragedy in the person of Mary J. R., a maiden lady aged sixty-eight, housekeeper and sister to Henry F., the two having lived together for a number of years. Her body was found on the second floor of the house, lying nearly flat, face downward, across the threshold of the doorway between the middle and the west rooms. The breasts were on the threshold. The head lay on its left side, facing southerly. It was four feet from the top of the stairway in the middle room and lay in a pool of blood about three by four feet in extent.

The body was well nourished, was five feet six inches in height, and weighed about 115 pounds. It still had some warmth. Rigidity was well marked. The right arm and forearm were extended at a right angle to the body, and the forearm was so much pronated that the palm of the hand was upward. The fingers on this hand were slightly flexed. There were two rings on the third finger. There was dried blood on the inside of the right hand and wrist. The left arm was by the side, at an angle of nearly 45° with the body. The left forearm was flexed at an angle bringing the left hand under the stomach. The thighs were parallel and close together. The right leg was a little flexed, and slightly everted from the line of the body. The left leg was extended so that the top of the right foot lay against the left heel.

The body was dressed in an old ragged gray waist and skirt, which was not fastened but lay loose in front, looped over the left forearm. A portion of this skirt extended as high as the lower border of the scapula. Against the right side, near the waist, as if the body might have fallen on it, lay a broken accordion, bloody, and stuck with blood to a piece of brown wrapping paper which was on the floor.

The skirts in front were wet with urine. There was no evidence of violation.

Autopsy. — The autopsy was held on the same day, August 7th, at 6 o'clock P. M.

The head and face were nearly covered with dried blood. Four separate bullet wounds were found in this region, one in the right temple, midway between eye and ear. The ball passed inwards and slightly downward. There were powder-marks two inches below this wound. The lobe of the right ear was of a purple color and showed powder-marks. The right auditory canal and both nostrils contained blood.

A bullet had passed through the lobe of the right ear. This ball, entering upon the external surface, passed upward, backward and out from the internal surface on a line parallel with auditory canal.

A third wound was on left shoulder, the ball entering one inch below the point of the shoulder, passing just beneath the skin downward toward the elbow, and out two and one-half inches below point of entrance.

The other bullet wound entered over the larynx. This was surrounded by powder-marks to the extent of two and one-half by one and one-half inches. This bullet passed inward, slightly downward and to the left of the trachea; near the thyroid cartilage it glanced to the left, passing inward and downward through the deep muscles of the neck, and lodged near the centre of the left scapula, fracturing that bone.

The tongue protruded one-half inch through the teeth (false teeth), the mouth was open one-half inch, the eyes were bulging and suffused, the left side of the face was flattened by pressure from the weight of the head resting upon it after death.

Upon removal of the calvaria a large clot was found in the right temporal region. The bullet which entered here passed inwards, very slightly downward and backward, lodging in the base of the skull, causing a fracture at the place of lodgment. The base of the brain on the right side was engorged with blood.

The pericardium, heart and lungs were practically normal. The heart was empty, aside from one-half drachm of liquid blood in the left ventricle; the aortic valve was slightly atheromatous; pleuritic adhesions were extensive and strong upon the right side.

The stomach was in a healthy condition and contained two fluid ounces of reddish liquid material; the spleen was rather small, the uterus was atrophied, the bladder was empty; the liver, the pancreas, kidneys and all the other organs were normal.

The cause of death was "pistol-shot wounds of the head and neck."

With a stenographer, a descriptive inventory was taken of all the rooms in the house. This inventory covers seven large typewritten pages. Only such a portion of it is inserted here as will give a general idea of the *topsy-turvy* condition of everything in the house, and may have some relation to the homicides.

In the kitchen, at the right-hand side of the door leading to R.'s bedroom, stood a piano-stool, on which was a carpenter's mallet, with blood on both heads, handle toward bedroom.

In the corner by the open door leading out of doors stood a box, apparently used as a receptacle for foot apparel and odds and ends; on this lay a pair of trousers with suspenders, a vest, an old shoe, two blacking-brushes and a box of old nails; the trousers pocket contained a penknife and a small amount of money in coin. The vest pockets contained a watch (running), a spectacle case, a notebook, and a mileage book, together with four dollars in bills. Other clothing was hanging in the bedroom, but the garments upon the box in the kitchen had the appearance of being last worn.

In the bedroom opposite the bed where R.'s body lay was a combination desk, with the top drawer pulled out eight inches. This drawer contained many articles, among which were hair brushes, opera glasses, several watch chains and two watches. The second drawer contained envelopes, paper and a 32-calibre revolver with five chambers, in which were four loaded and one discharged cartridge. The quantity of dust upon it precluded the theory of recent use. In the bottom drawer were eighty-five watches, most of them cheap in value. Next to the desk stood a bureau filled with clothing, books, bundles and cloth. In a rocking-chair near the bed was a quantity of clothing and a truss for double hernia (it was found that R. had hernia). A small closet at the foot of the bed and to its left contained clothing for both ladies and gentlemen. A thick layer of dust covered the clothing. Between the head of the bed and the kitchen door was a small stand, upon which were two diamond rings, a jack-knife, several bottles, two bunches of keys, watch chain, two old padlocks, screws, a box of receipts and other promiscuous matter.

The other rooms on the first floor were filled chiefly with unused furniture, organs and pianos.

Up a narrow stairway we found the chamber-floor divided into three rooms: The *middle room*, at the top of the stairs, one chamber *east* and another *west* of the middle room. Miss R. occupied the west room, over the kitchen; her body lay in the doorway between this and the middle room. The door was off its hinges, and stood between the doorway and her bed. Upon her bed were two quilts, three pieces of quilts, an old woollen blanket, two skirts, three pillows a bundle of rags, pieces of new cloth, mattress, and three feather beds. Another feather bed lay on the floor. The bed had the appearance of having been occupied by some person lying crosswise. This room contained also a gasoline stove, zinc, considerable earthen and tin ware, a barrel filled with jugs and bottles; books, old pails, papers, bonnets, a box containing feathers; a clothes-rack, bed ticking, some stovepipe, a rocking-chair, two cane-seated chairs, a marble top stand, a tin boiler, a trunk packed with books, clothing and cloth; an accordion, a bag of carpet warp, a snare-drum, a clock, a wash-bowl, a chamber vessel, a lamp shade, a broom, etc.

This elaborate and detailed description, along with the record of the view and autopsies, was filed at once with the court and district attorney. Photographs were taken showing arrangement of the rooms, position of the bodies and location of the wounds.

Three officers were detailed from the State detective force who visited the premises and were working upon the case within a few hours. The Mayor of the city gave the case his constant personal attention; he employed a special detective. The city offered the liberal reward of $1,000 for the finding of the perpetrator of the crime. Eighteen months have now elapsed and notwithstanding the vigorous and untiring work of experts and officials, striving to unravel the mysteries this case involves, as yet all efforts of city and State authorities have been entirely unavailing.

Mr. R. was a money-lender and often took mortgages upon personal property. He dealt somewhat in musical instruments, sewing machines, watches, jewelry or whatever came in his way. While sharp at a bargain, he was considered kind-hearted, reliable and worthy. He was seen upon the street as late as 9 o'clock the night of his death. He was not wealthy and was not supposed to have large sums of money on his person. He was temperate, social and attentive to business. His sister was somewhat eccentric and a *very* slovenly housekeeper, but she was honest and inoffensive, affectionately attached to her brother, and had no enemies. What the motive could be for taking either of these lives is an unsolved mystery. One family, occupying a house only twenty feet from R.'s, was up nearly all night the night of the homicide, but heard no pistol shots or other unusual sound. Another house, only seventeen feet distant, was occupied by the owner alone, and he heard no disturbance.

The temperature of the bodies and the contents of the stomachs in semi-digested condition lead us to believe that the homicides occurred at an early hour, August 7th, probably between 1 and 3 o'clock. How one or more persons could enter this home and with some instrument (probably the blood-stained mallet) slay one victim, seek the chamber and fire at least four shots into another, escape, and leave no clue, seems a mysterious problem.

DISCUSSION.

DR. QUIMBY: I would like to ask about one matter, and that is the obtaining of photographs: is that expense attended to by cities and towns, or the district attorney?

DR. BROWN: In my case, and in cases I have had before, Mr. President, I have attended to the expense myself, and presented the bill to the county commissioners; they have always audited the bill without asking any questions. I do not know whether this is the general practice, but it seemed to be a feasible way of doing it.

DR. HOUGH: I would like to ask why the reader did not feel absolutely positive that the mallet found was the weapon with which the man was killed.

DR. BROWN: While I do feel morally certain that that was the instrument used, from the position in which I found it lying, and from the fact that it fitted so nicely the wounds made, perhaps I could not say I was positively sure; if I was asked by the Court I should say, Yes, that it was my opinion that it was the instrument used. There is a probability of that being the instrument used, beyond a reasonable doubt.

DR. DRAPER: I want to say, in regard to the question, that I do not think it quite a proper one. I do not believe in a capital trial it would ever be asked of a medical witness, "Is that the weapon that made those lesions?" The question would be, "Could a weapon like the one in evidence make the lesions you found?"

DR. HOUGH: I was prompted to ask that question in regard to the mallet from some experiments which I made in regard to skulls of some animals. It would be impossible, unless you saw the deed committed, to say that such and such a weapon was used. I simply asked the question to see if others felt as I did. The same axe may produce a great variety of incisions; because that axe fits the dent it is no reason why that axe, instead of one similar to it, produced the wound.

DR. BROWN: The gentleman in this same case might say that this mallet may be placed over the wound already made, and that blood was placed upon it and left there for the purpose of misleading the officers.

DR. HARTWELL: I would like to mention one point in regard to the essay, and that is the position of the powder-mark in regard to the pistol-shot in the ear. Dr. B. D. N. Fish read a very excellent paper showing that, where powder-marks were made on the skin, they were invariably above the point wounded — above as regards the top of the pistol. This essay appears in the *Transactions* of this Society, in Volume I, and is very valuable, and of practical use to every medical examiner.

DR. DRAPER: The characteristic position of the powder-burn on the skin was thought to be due to the recoil of the pistol. The explanation is set forth in Dr. Fish's paper. I do not think he laid so much stress on the powder-marks alone as upon the burning or brand, indicating just how the hammer was placed. If the hammer were up the brand would be above the bullet-mark; if the hammer were reversed and down the brand would be below, due to the recoil of the weapon; if the weapon were held in a vise, and fired in that position, the brand would not appear as above described.

DR. HOITT: I read with a great deal of interest the paper alluded to; I made some experiments with powder, and there is no question but that powder-marks owe their situation with reference to the bullet-mark to the recoil. I had occasion a year or two ago, in testing, to see the distance that flesh would be scorched by powder, and used common black powder; I tested the recoil of a single-barrelled gun or pistol. When the gun was made fast in a vise and fired the test was to see, when the powder was burning, whether the gun could burn over a certain quantity of powder, and I found that if one used more than a certain amount the excess was unexploded and wasted.

MEDICAL EXPERT TESTIMONY.[1]

BY JOHN C. IRISH, M.D., LOWELL,
Medical Examiner.

THIS article is offered, in the main, as a defence of the medical expert and of medical expert testimony as it is presented in our courts to-day. It is also offered as a protest against the scathing criticisms that this kind of testimony has so often received of late at the hands of many lawyers, and, I regret to say, of many members of the medical profession as well. In fact, I am not sure but that these criticisms have come fully as much from physicians as from lawyers. For the last few years the various medical publications have been teeming with articles sharply criticising the character of medical expert testimony, and, at the same time, suggesting various modes of improvement in the securing of this class of evidence. The general trend of this criticism, both by lawyers and doctors, has been to characterize this class of evidence as confusing, misleading, valueless, mercenary and false, and an unbiased reader knowing nothing of the facts in question would be irresistibly led to the conclusion that a large proportion of medical gentlemen, when they were placed upon the stand as experts, become unscrupulous partisans and oftentimes untruthful contestants in the case. And I especially protest against this misrepresentation coming from members of the medical profession, nearly all of whom, at one time or another, have occasion to be employed as expert witnesses in our courts.

When we recall the high standard of honor by which the conduct of the great mass of our profession is regulated in every other relation of life, through all the cities and villages of New England, and recall, too, the universal confidence and respect reposed in them by the communities in which they live, and that in all matters of business, education and health that engage the attention of public-spirited citizens we find the members of our profession always in the lead, and always active in every movement that makes for the well-being of our citizens at large, it would indeed be very strange if in one single relation this great body of men, so honorable and so honored, should become mercenary and untruthful as medical experts in our courts. The whole fact is that when we sift this vituperation down, and get really at the bottom of the ground for it all, we simply find that it rests upon this one fact, that medical experts very frequently, in the trial of a particular cause, give very different and oftentimes conflicting opinions. Now, we will all agree that in the trial of very many causes, and in fact all those causes that have to do with the physical and mental condition of the litigants,

[1] Read before the Society, February 1, 1899.

medical expert testimony is a necessity. If we could thoroughly scan that broad realm of medical jurisprudence in which medical expert testimony necessarily plays an important part we would find that many seeming contradictions of the different expert witnesses would be reconciled, and we would see, too, that the irreconcilable conclusions arrived at were in no way inconsistent with the perfect integrity and honestness of purpose of the men who have testified; but the necessarily narrow limits of this article will allow us to cover only a few examples here and there, yet I am sure these will be enough to show that the medical expert is usually unjustly assailed. I do not mean to say that there are no physicians who as medical experts are mercenary and untruthful, but I do maintain that their number is exceedingly small, and that the appearance of such men in our courts, bringing disgrace to medical expert testimony, is of infrequent occurrence.

For the past twenty-two years the Commonwealth has relied, in the main, for its expert testimony in its prosecution of criminals charged with manslaughter and murder upon seventy-two expert witnesses, most of whom are members of this Society, and in the great number of prosecutions during this long time I do not know of a single instance in which one of these experts of the Government, in his statement of facts, or in the giving of his opinion as an expert, has ever been accused, or suspected, of swerving from the exact truth for the aid of the prosecution, or for the harm or benefit of the accused.

Turning now to the civil courts, we come to that broader field of judicial inquiry which requires the aid of the medical expert. Here we encounter in great numbers and endless variety those suits for redress for every kind of personal injury, and in the trial of these cases the medical expert is an indispensable adjunct. Taking as an example one of those suits for personal injury in which the plaintiff is asking for compensation, let us look for one moment at the kind of testimony that is sought from the expert witnesses of both plaintiff and defendant. We find, as a general rule, that the medical experts are giving their testimony in two very distinct directions; that is, we find them testifying both as to matters of fact and questions of opinion. The medical gentlemen called will usually consist of the doctor who has attended the patient, and the several medical experts on each side, who have also, on one or more occasions before the commencement of the trial, examined the plaintiff. Therefore, all of them are in a position to testify, to a greater or less extent, as to matters of fact.

First, the attending physician presents the facts in the case, giving, for instance, the history of the patient's condition from the time of receipt of the accident, the treatment he received, and his condition as he has gone along, up to the time of the trial; that is, he is asked to give all these facts, and then, as an expert, too, to give his opinion as to the seriousness of the accident, the effect that it has had upon his sufferings up to that time, and also his opinion as to the future damages the patient may sustain. The medical experts on both sides are also asked to testify as to the existing conditions

they found upon examination; and there is one thing particularly noteworthy, namely, that in all these questions of fact as to the condition of the patient we find the expert witnesses practically agreeing. When one leg measures in length two inches more than the other, or is that less in diameter, when one knee is swollen to twice the size of the other, a joint anchylosed, muscles atrophied, limbs distorted and tendon reflexes impaired, we never see, on the part of these experts, a disagreement as to the existence and extent of these injuries; that is, it is especially important to note the substantial agreement that we always find in all these things. In short, the palpable, perceptible facts of the case are always stated with the utmost fairness. There is never any disagreement in the testimony of the experts between one side and the other. The attending physician, in spite of all the sympathy and interest that he has in his patient, as you will note, is very faithful in his testimony as to these patent facts in the case.

But the moment the scope of inquiry changes from the lesions which the patient presents, and which are patent to our eyes and our touch, and passes on to matters of opinion, then wide differences become apparent. Not only will the opinions oftentimes be very different but absolutely conflicting. It is simply that the witnesses have passed from a field of exact knowledge into one more or less involved in conjecture and theory. For instance, the plaintiff may come before the experts presenting no physical signs of injury whatever. There has been no injury of a limb; no scar of any wound on the body; no evidence of any injury of the spinal column; no paresis of any muscles; no fault of tendon reflexes; in short, no lesion upon which we can place our fingers. Still, the patient has received a fall, or a concussion; shows anemia, a lowered vitality, complains of severe headaches, loss of memory, fault of vision, pains in the back, weakness of muscles, loss of sleep, and numerous other symptoms (frequently inconsistent with each other) that the neurasthenic often presents. To the one physician, this imaginary patient of mine presents a typical case of concussion of the spinal cord. He is perfectly certain that such an accident is possible and that it has happened in this case, and he may even go so far as to believe and explain that at the time of the accident there occurred a disturbance of the ultimate molecules of the spinal cord, and that the present condition of the patient is absolutely typical of such an accident, and that her future recovery is a matter of very great doubt. Believing this, he will probably go on and explain to the jury that this aforesaid disturbance of the ultimate molecules has actually occurred, and if he believes this theory at all he will be very certain of the correctness of it, although, of course, there is not one iota of evidence that such a thing did occur, or ever can. While to another expert, this same patient, without the slightest evidence, from the crown of her head to the soles of her feet, of having ever received any injury, so far as her physical examination goes, presents simply the type of the hysterical woman, and, in view of the circumstances surrounding the case, in his mind is probably a malingerer.

Between these extreme and irreconcilable opinions as to the character of the case will be presented perhaps as many others as there are different men to express them, the latter less radical, but as inconsistent with each other as the two that I have indicated. As we candidly and impartially consider this case, no one of us would doubt for a moment that this conflicting and irreconcilable testimony was given by the various medical experts perfectly honestly and conscientiously. In fact, these differences of opinion, so far as they show anything, tend to establish the absolute good faith and integrity of the witnesses, and really, who in the world can say, in the midst of these differences, where the truth lies? Is there any diagnostician among us of such wisdom and such experience that he can aid the jury in elucidating the exact truth? While it is very desirable to the cause of justice that this snarled skein of fact and theory should be unravelled and the truth separated from the error, yet there is no source from which this assistance can come. The fact is that justice is asking an exact opinion from a very inexact science, and the medical experts have given all of knowledge they have and all of theory that they have constructed to elucidate the complex conditions that surround the case. They have simply given the best they had, and that is very far from any precise conclusions.

In support of my contention, a very eminent lawyer and judge of New Hampshire, with many years of experience in court and on the bench, expresses himself in the following terms:

"This bias, or inclination, in favor of the party by whom the witness is employed is probably the most frequent complaint of all against the expert witness, and the inclination, or partiality, is often characterized by terms indicating dishonesty and corruption. But it is my belief, resulting from the observation and experience of many years, that there are few instances in which the scientific witness permits himself to testify, or to be engaged on a side contrary to his convictions derived from a careful examination of the case."

I suppose another cause for these irreconcilable differences of opinion may be found in the mental characteristics of physicians, themselves, as a class. For the most part, they are men of strong convictions. They are much in the habit, in the absence of exact knowledge, of framing theories and tracing back causes from effects, or following out effects from causes. An endless field of speculation is presented to them in the study of the influence of the mental and moral conditions upon physical disturbances, but most of all in the study of the functional deviations of the nervous system from the standard of health. This opens a very wide field for speculation and theory, which is very little guided by actual and precise knowledge. Physicians are, therefore, very prone to form all sorts of theories, and, when once formed, they adhere to them with a pertinacity that would even do credit to members of the clerical profession. Hence, when we descend to the practical arena of the court room, these pet theories of ours are sure to come out and stand forth in clashing inconsistency with each other, and the strict honesty of the experts simply emphasizes the

contradictions that appear. It is just this condition of things that is complained of in the matter of medical expert testimony.

Now, is it certain that the cause of justice would be promoted if we could all agree in our theories instead of having different ones? Is it at all certain that an agreed theory would bring the jury any nearer to a just appreciation of the case than they have now reached in sifting the conflicting testimony as it has been presented? It is true that this condition of things is unsatisfactory to court, lawyers and physicians themselves, but is there any remedy for it? It seems to me that the character of the testimony asked for and the characteristics of the men giving it make these differences inherent and irremediable. A supposed remedy, however, has been suggested, and that is that in the trial of these causes the judge should appoint some disinterested and capable expert to testify in the case, while allowing the litigants to call their respective expert witnesses, as is now done. This course of procedure seems to me to be open to some very grave objections. In the first place, we have no reason to suppose that the physician, or surgeon, so selected, would be markedly more competent than other experts who would be employed, while the known fact that he was thus selected to instruct the jury would give his theories in the case almost the weight of judicial authority. Yet, as a matter of fact, he would be quite as likely to be wrong in his theories and conjectures as the other experts employed. So, while he *might* further the cause of justice, there would still be a very great danger, on account of the weight of authority that would thus be given his opinions, that he might work far greater injustice to either defendant or plaintiff than would be the case with the present procedure. That is, simply his official position in the court would give to his opinions a weight and importance that could in no way justly attach to them. Were it possible to select a single man so markedly above his *confrères* in experience and ability that his testimony in a given case would be entitled to the greater authority the court would give him this selection might be a remedy for the difficulties we are considering. If the man selected were not superior in ability and judgment to his *confrères* in the case his testimony would acquire a fictitious and unjust importance. Therefore, I believe that the selection of such an expert in such a manner would be a hindrance to the cause of justice rather than a remedy to the conditions complained of. For the best selection possible of such an expert to be made, it would have to be made by our profession. When made by the judge it is a selection of a layman, so far as the medical profession is concerned, and it would be just as absurd, in case some lawyer were to be appointed to the bench, to leave the selection of that lawyer to medical men as it would be to have a member of the legal profession, even if he were a judge, select the most competent expert from among physicians. Now, personally, if I were going into court asking justice for some injury received, I would go about among my professional brethren and select those experts who entertained the same opinion as to the extent of my injuries, the amount of damage I had received and was going to suffer, as I believed myself, and I would call these men as medical experts. On the other hand, I

should expect the defendant corporation to select those experts who entertained the view of my condition that accorded with theirs, who, in short, believed exactly as they did, and we would present our case before the jury. I certainly should seriously object to an expert employed by the court testifying in this case of mine, simply because I should feel that his testimony would acquire a weight and importance to which the ability of the man would not entitle it, and I believe that the jury, listening to the testimony of my experts on the one side and that of the defendant corporation on the other, would be more likely to reach a just conclusion in the case without, rather than with, the assistance of the court expert.

In conclusion, I will say that in this matter of the employment of expert testimony I do not believe there is so very much to correct. I hold that the great mass of medical experts, which includes our entire profession, are conscientious and honest, with very rare exceptions, in the evidence they give, and that, so far as the testimony of experts in regard to fact is concerned, they always agree, and in so far as their testimony is an expression of opinions, they will often very widely disagree, and there is no remedy for that. And whatever improvement the future may have in store for this kind of evidence must simply come through the medical profession itself. The greater advances we make in science, the greater our ability, the better we understand the laws that govern the mental, moral and physical natures of our being, the less erratic and the more uniform and reconcilable our theories will become. And outside of this advancement there is no remedy for the faults of medical expert testimony, if to any great extent such difficulties now exist.

DISCUSSION.

Dr. Hough: The greatest difficulty that I have seen in this question of expert evidence comes in this way: The lawyers want experts who will look after the case the same way they do, strictly as partisans, not anticipating either truth or justice, but wanting to make the best possible showing for their side. The man who is conscientious or careful, or who refuses to be led into statements, and is not willing to agree to supply his own lawyer what he wants, will not be called by choice, although he may be called when absolutely necessary. In very few cases have I seen any difficulty about the agreement of experts. If the experts of the two sides can be brought together, and amicably discuss the case (I have very frequently been able to bring that about), the results so far as they concern conservative statements and answers to hypothetical questions and avoidance of conflicting statements on the witness-stand have been satisfactory.

In the important matter of traumatic neurasthenia, I think we all now agree fairly that there is such a thing. I have had occasion to follow up a few cases (only three or four) of so-called chronic neurasthenia after the legal part had been settled one way or the other, and as far as such a small number of cases goes I feel that there is a real neurasthenia case, and genuine chronic neurasthenia, for patients have the elements of neurasthenia for an indefinite

time after the settlement of the case, and it makes no difference whether the case is settled out of court or in court.

As for the mode of using expert testimony, whether it is open to improvement or not I do not know. I think many of us, who have read a good many foreign papers, will agree that they do things better in France and Germany than here. It is a question of national disposition, whether our juries will be properly impressed by the report of a scientific committee on the course or examination of a medical case. I think anybody would be inclined to think that in examining medical experts anything would be better than the present mode of procedure.

Dr. Draper: I want to say at the outset that I am in substantial sympathy with the views of the reader of the paper, and in accord with his very just ideas as to the conscientious work on the part of the members of our profession. It seems to me that the difficulties in regard to expert testimony may be brought down to two classes. One of the difficulties arises from the fact that, although we are all honest, we are all human, and when called into court, as we ordinarily are, by lawyers, not by judges, we go there with an unconscious and inevitable bias of partisanship, which is developed by the manner in which cases are prepared. As the reader in his supposed case put it, a person seeks for redress by damages, and, for the purpose of substantiating his side, secures the aid of medical expert evidence. He has no use for candid persons, but wants to go before the jury with witnesses who will help him accomplish his end. The expert goes into court so handicapped with prejudgment of the case that he cannot keep that poise which is so indispensable for strict administration of justice. Another difficulty arises from the rules of law and the limitations imposed on medical men by the judicial usages and methods under which they are examined. Questions are asked requiring categorical answers, without the full statement of the opinion which the witness has in his mind, and without any candid expression, which would be understood before his own professional brethren, about the case in hand. These two kinds of obstacles include nearly all that is objectionable in the prevailing system. In regard to the practicability of reform, I admit that my views have changed considerably in the past fifteen years. I know there is very strong objection to any change, and we shall look in vain for help from the Legislature; lawyers object to any reform that will bring about a new method of using experts, because they insist on having control of all the evidence that will be favorable to their side. So I think we can unhesitatingly say that lawyers will oppose effectively any attempt on the part of physicians to bring about reform.

There are two ways left to us as physicians that will help, in my opinion, in improving medical evidence. One, which is often suggested, is that in every case which is brought into litigation there shall be full examination of the plaintiff by medical experts on both sides, that the patient shall be examined in the presence of all, so that there shall be agreement as to the facts and objective data of the case. And, in the second place, it is important that every one of us shall try to equip himself with the utmost honesty and

candor of which he may be master, thus trying to overcome, as far as possible, the difficulties which are so apparent to every one of us when we go into court.

DR. HOUGH: I should like to ask Dr. Draper his experience in answering questions in court, whether the judges are not willing to allow him the greatest possible latitude in explaining his answers to these questions. Lawyers are extremely anxious to pin us down to "yes" and "no," but I find judges different, allowing physicians to explain, with as many qualifications as they desire, and never compelling them to limit the answer to plain "yes" or "no."

DR. DRAPER: In my own experience, they want categorical answers, but will let explanations come later. I have been repeatedly required to answer plain "yes" or "no," and then, if I wanted to qualify the answer, I could do so, but I sometimes found it was then too late, and that a wrong impression had been made by the arrangement of the elements involved in the reply.

DR. HOUGH: This must be peculiar to individual judges. It has not been uncommon, in answer to questions, that the lawyer wanted "yes" or "no"; but it is impossible to say definitely "yes" or "no"; the answer must oftentimes be a qualified one, and the judges have always upheld me.

DR. ABBOTT: The suggestion in the last part of Dr. Irish's paper struck me as feasible — placing the hired expert above the plane of partisanship.

It does seem to me that the very existence of this Society has had its effect on the courts. I think, if we follow the trials that have taken place in the last ten years, less men of disrepute are employed than were employed twenty-five or thirty years ago, and I have no doubt that this is due to the existence of a society like this, which has done its best to elevate this function of the profession.

DR. HOUGH: One other question I should like to mention in regard to the medical expert witness. I have heard lawyers say that a wonderful thing about the medical expert witness was that he apparently knew everything, and whatever was asked him he could give a fairly positive answer. I think, if the man would recognize that fact, and not try to give answers to everything, that not infrequently lead to his being tripped up, and if he does not know positively about a thing say so frankly, he will take away from the lawyers, who seem to dislike us so much, one of their sharpest weapons.

DR. HARTWELL: I believe that neither the courts nor the public are fully prepared for any change in our methods of expert testimony before the courts. I have heard judges say that they did not like hypothetical questions. I believe if these could be done away with (those requiring categorical answers) our position would be very much stronger than at present.

One point is certain, and that is that we are changing in our method of giving expert testimony; and I think it is also true that we are getting more real experts on medical and surgical cases, men whom we look to in matters of judicial cases. But I believe, nevertheless, that the testimony of the good old family physician, given with so much honesty, is the testimony upon

which the courts are bound to rely. I belie
jury, in the old family physician, and that his
have very great weight. And, as we become
honesty shall enforce itself, because we shall base
edge than we shall upon theory.

1899.

DR. IRISH: I have nothing to say in addition, except that, so far as the discussion has gone, it so well agrees with me that the improvement in this matter of medical expert testimony rests with the profession and the professional man, and the agreement in this Society that the great mass of physicians, who are all experts in our courts, are honest men.

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Dr. Hough: I should

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APPENDIX.

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CRIMINAL ABORTION, WITH A "DYING DECLARATION."[1]

BY F. W. DRAPER, M.D., BOSTON,
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THE credibility of the statements made under a sense of impending death by the victims of homicidal violence has been recognized and admitted by the courts for many years. Properly authenticated by testimony, these "dying declarations," as they are called, have all the force of sworn depositions and are regarded as equally good evidence. Though made out of the presence of the persons accused, they are held to be admissible and are an exception to the legal rules governing hearsay testimony.

The principle on which the validity of this kind of evidence rests is a very ancient one and was derived from the Roman law. It is based on the fact that these declarations are made when the person making them is about to die, when every motive to falsehood is silenced, when the opportunity for personal advantage is slipping away momentarily and the mind is induced by the most powerful and solemn considerations to state the truth. Shakespeare well expresses the situation in these words:[2]

> "Have I not hideous death within my view?
> What in the world should make me now deceive,
> Since I must lose the use of all deceit?"

A situation of such a character is considered in law as creating an obligation to be truthful to which an oath cannot give any additional force.

But in order that the statements of the dying patient, the victim of unlawful violence, shall have the desired effect and validity, the conditions prerequisite are very exacting. Unless these conditions are fulfilled and are so made to appear very clearly, the court will exclude the dying declaration as incompetent. I cannot do better in this connection than to quote a few words from Greenleaf, whose work on the "Law of Evidence" is a leading authority. He says:[3] "It is essential to the admissibility of these declarations, and is a preliminary fact to be proved by the party offering them in evidence, that they were made under a sense of impending death, but it is not necessary that they should be stated at the time to be so made. It is enough if it satisfactorily appears in any mode that they were made under that sanction, whether it be directly proved by the express language of the declarant, or be inferred from his evident danger, or the opinions of the medical

[1] Read before the Society, June 13, 1899.
[2] Richard II.
[3] Law of Evidence, Section 158.

or other attendants, stated to him, or from his conduct, or other circumstances of the case, all of which are resorted to in order to ascertain the state of the declarant's mind. The length of time which elapsed between the declaration and the death of the declarant furnishes no rule for the admission or rejection of the evidence. . . . It is the *impression* of almost immediate dissolution, and not the rapid succession of death, in point of fact, that makes the testimony admissible. Therefore, when it appears that the deceased, at the time of the declaration, had any expectation or hope of recovery, however slight it may have been, and though death actually ensued an hour afterward, the declaration is inadmissible. On the other hand, a belief that he will not recover is not in itself sufficient unless there be also a prospect of 'almost immediate dissolution.'"

And Chief Justice Shaw, in instructing a jury in a leading case,[4] used these words: "Where a person has been injured in such a way that his testimony cannot be had in the customary way, the usual and ordinary rules of evidence must, from the necessity of the case, be departed from. The point first to be established is that the person whose dying declarations are sought to be admitted was conscious that he was near his end at the time of making them, for this is supposed to create a solemnity equivalent to an oath. If this fact be satisfactorily established, and if the declarations are made freely and voluntarily and without coercion, they may be admitted as competent evidence."

In 1889 the Legislature of Massachusetts extended the scope of this variety of evidence, so that, in addition to its admissibility in trials for homicide, it is now available in the prosecution of indictments for criminal abortion. With commendable sagacity and under an appreciation of the very great difficulties which beset the proof of culpability in abortion cases, the General Court has very materially helped in securing the conviction of offenders of this class, by enacting that the dying declarations of those who have submitted themselves to criminal procedures for inducing miscarriage may be received as evidence.

It is obvious from what has preceded that the relation of medical men to this kind of evidence is at once delicate and responsible in the highest degree. Physicians have it largely in their power to render dying declarations fruitful and of great service; and it is, on the other hand, quite possible, through their carelessness or their ignorance of the essential and exacting conditions involved, to make what otherwise would be useful entirely sterile and valueless. As the medical attendant of the dying victim of an abortion stands at her bedside, perhaps at his very first visit after the abortionist's performances within her pelvis, he has it under his control to do then and there, in the fleeting moments of the end of her life, that which will secure the prompt conviction of the offender. He sees that his patient is about to die. He observes her mental condition. He takes note that her answers, though slow and difficult, are intelligible and rational; she is neither delirious

[4] Commonwealth *vs.* Casey, 11 Cushing, page 417.

nor irresponsive. From his lips comes now to her the inexorable word which, difficult for him to utter and hard for her to hear, takes away from her any hope of recovery. He awaits her first utterance after this fateful announcement. If that utterance expresses a realization and belief that expectation of living is abandoned, then the statements that follow are a "dying declaration," and the physician is the one who receives them, records them as they are made and repeats them later in court.

It is he, then, who makes clear at the trial the exact circumstances under which the dying patient made her statement; it is he who represents her in the evidence as though she herself were on the witness-stand; it is he who repeats her words; it is he who defines with precision the mental and physical condition of the patient when those words were spoken.

In this connection, certain negative considerations relating to dying statements may be usefully remembered.

For example, it is not essential to their validity that they should be reduced to writing or that they should be signed by the declarant; but it is obvious that their value is very greatly increased by this precaution and the comfort and effectiveness of the medical witness who has received them and authenticates them on the witness-stand is immensely aided by the notes which he has made on the spot and by his carefully written record of the very words which the deceased person used.

Again, it is not the State which is the sole beneficiary of dying declarations; such declarations are equally competent and forceful when they help an accused defendant as when they help the prosecution, and the person to whom the declaration was made cannot exercise discretion as to omitting any part of it from his testimony. The "whole truth" is required.

"It is not an objection to the admissibility of dying declarations that they were made in answer to leading questions or obtained by pressing and earnest solicitation."[5] But the medical man who consults his personal well-being and looks into the future far enough to see himself on the witness-stand will avoid the methods of cross-examination, will resist temptation to exhaustive questioning, and will receive as an almost passive recorder whatever is imparted; for his zeal to get all the truth possible, and to obtain from the dying patient, before it is too late, all the facts, will surely be misinterpreted and made to appear to his disadvantage as a medical advocate.

Finally, it is not essential that the dying declarant should express his replies in words. The courts have admitted statements in which a pressure of the hand, a movement of the head, or any similar mode of communication took the place of spoken words.

After this too lengthy introduction, I am glad to report to the Society a recent case of criminal abortion which was tried in this county. My satisfaction in making this report is the greater for two reasons: the abortionists were found guilty, and their conviction was very largely due to the altogether admirable and acceptable manner in which the victim's dying declaration

[5] Greenleaf: Law of Evidence.

was obtained, and was later laid before the jury. The case is an object lesson and deserves sympathetic recognition by medical men.

Late in the afternoon of Thursday, March 16th of the current year, a married woman of 26 was admitted as a patient at the Boston City Hospital, the information accompanying her being to the effect that she was suffering from the consequences of a miscarriage unlawfully induced. She was brought in an ambulance, and on her assignment to a bed was seen in a few minutes by Dr. Mackay, the house physician. He appreciated immediately that her condition was alarming and that her death was imminent. She was very weak, was inclined to sink into a drowsy torpor, from which she was readily aroused, presented a cold surface, and had a temperature of 99.6° and a thready pulse of 120. There was pelvic tenderness and a foul vaginal discharge.

Here, then, was a medico-legal emergency requiring prompt action, tact and an intelligent appreciation of the exacting precautions requisite, under the law, to make this woman's statements of any use as evidence. Fortunately, the attendant possessed all three of these qualifications, and he managed the crisis with commendable success. His first act was to call to his aid from the administration office of the hospital Dr. Charles B. Knight, the first executive assistant. To Dr. Knight the patient's condition was manifestly desperate, and he agreed with Dr. Mackay that if a dying declaration was to be had at all, this was the time, without further delay. Dr. Knight then said to the patient, "You are a very sick woman. There is no chance of your recovery." She replied in low tones, scarcely audible, "I realize it." She was then asked if she wished to make a statement of the circumstances of her sickness, and she assented and gave her story, partly in answer to questions and partly without such aid, her answers being noted as they were spoken. These notes were then written out in proper form on the spot, and were read to her. She said she did not wish to change a word of the statement and added her signature to it. This declaration was as follows, including, without change, its crudities of expression and some obvious inaccuracies:

BOSTON CITY HOSPITAL, March 16, 1899.

I, Frances Adams, twenty-six years old, married seven years, believing that this is my last and most truthful statement, do assert that a week ago yesterday, that is, Wednesday, I went to Mrs. B. F. Barrows or Mrs. F. B. Barrows, 339 Washington St. She was a small-sized woman, dark complected, about thirty-eight years old, with dark hair. I waited a few moments, and then she took me upstairs to her private bedroom. (I was recommended to her once before, about seven months ago. She did not do anything for me at that time, because I did not have enough money.) She told me I could take my clothes off or leave them on, and to lay down upon the bed on my side. She passed an instrument with a wire in it up as far as she could and it remained until the blood and pains came. The hard pains began at Thursday noon and continued till Friday at 6 o'clock, and then the child, clots and afterbirth came away. I remained at her house till the ambulance called for me to-day, bringing me here. My husband got Dr. D. F. or F. D. Simmons and sneaked him into the house, and Dr. Simmons called the ambulance.

Information of this affair was at once sent by telephone to the police, and in less than two hours the woman Barrows was standing by the patient's bedside at the hospital, under the escort of a patrolman. The patient's identification of the offender was complete. The latter's only comment was, "There must be some mistake. This is a poor way to repay an act of neighborly kindness."

In the interval between the completion of the dying declaration and the arrival of the alleged culprit named therein, the patient reinforced and enlarged the information previously given. She said, among other things, that before Mrs. Barrows passed the instrument into her womb and left it there, her husband, Barrows, had tried to do the same thing but his attempts were ineffectual, and he handed the catheter to his partner-in-mischief to accomplish what he had failed to do. As the immediate result of this later statement, Barrows was at once arrested and made co-defendant with his wife, as he was just before her partner in felony.

The rest of the story is soon told. Though there was some temporary improvement in the condition of the Adams woman as the effect of judicious treatment, wise stimulation and skilful nursing, aided by the mental relief that comes from an unburdened conscience, septicemia was persistently doing its deadly work. On the last day of March, fifteen days after her admission to the hospital and twenty-three days after the criminal operation, she died.

The medical examiner's relations to this case, which now for the first time demanded his notice, were really of secondary consequence. The lapse of time, thorough curetting of the interior of the womb, persistent aseptic douching and reparative processes had obliterated the initial lesions, if any such existed, which the passage of the catheter into and through the os uteri had left, so that the autopsy added little in the way of evidence to what was already known through clinical and detective observation. The pathological features may be summarized thus: Sallow skin, with numerous petechiæ about the neck and upper thoracic region; milk in the breasts, with marked dark-brown areolar pigmentation and swollen sebaceous glands; many punctate subpericardial hemorrhages and a single small pyemic centre in the left ventricle; thickening, reddening and fraying at the edge of the anterior cusp of the aortic valve; septic foci in the back of the right lung and base of the left lung; well-marked infarction of the spleen; septic inflammation of both kidneys, with some minute pyemic or embolic foci; a thrombus in the lower part of the vena cava inferior, nearly obliterating its lumen and forming an obstruction an inch long, with firm periphery adherent, except at its posterior surface, to the vessel's walls. The pathogenic micro-organism was the streptococcus.

The peritoneum was normal. The womb was enlarged to a length of four and a half inches and a breadth of three and a half inches; its interior was dry, smooth, and only moderately reddened; at its fundus posteriorly was the clearly defined remnant of a placenta; the right ovary contained a

corpus luteum, small in size but typical in structure and aspect. The brain was moist and pale.

The conclusions which the autopsy indicated were: (1) that the woman had recently been pregnant; (2) that she had recently miscarried, and (3) that the cause of her death was septic infection and inflammation consequent upon the miscarriage. The medical examiner could not say, and did not attempt to say, that his observations, independently of any other proof, gave any evidence that the abortion was due to instrumental and unlawful interference with the pregnancy; he admitted that, so far as the anatomical appearances were concerned, the miscarriage might have been a purely accidental one. But on the other hand, it was clearly his belief that all the lesions which he found were consistent with the view that the initial cause of the woman's miscarriage and death was the introduction of a dirty catheter, held in dirty hands, into her pregnant womb, with lack of proper care immediately after.

The usual judicial processes followed in due form and resulted in an indictment in which both the man and woman, Barrows and his wife, were named as defendants. Their trial came in less than two months after the act of which they were accused. Justice, for once, was speedy. The interest of the trial centred almost wholly about the dying declaration of the victim of the crime and the circumstances under which it was sought and obtained. It was useless to assail it or to question its credibility. Even the pathetic denial of the Barrows woman on the witness-stand that she was guilty of the charge, or that she knew anything of the miscarriage or its cause before she was called to give some neighborly service after it was all over, did not avail to contradict the solemn assertions from lips now dead and sealed. The jury's conclusions were aided and reinforced by testimony as to the character and pretensions of the two defendants. To everybody except "ladies in trouble," Barrows was a house painter; his wife worked in a jeweller's shop. But their activities were not limited to these commonplace vocations. Printed cards found in their trunk stated that "magnetic and electric treatments for all female weaknesses, leucorrhea, suppressions, cancer, tumor, etc.," were to be had at their place of business, and that "female irregularities" were "a specialty." So far as appeared, the pharmacological knowledge of this altruistic pair lay concealed in one list of drugs in a memorandum found with the cards; this list contained pennyroyal, ergot, cotton root and tansy in suggestive association and bearing the label "emmenagogue." The jury's deliberations were brief and the verdict was soon reached, both defendants being found guilty. The man was sentenced to State prison for seven or nine years and the woman is in Sherborn Reformatory for five years.

It has seemed to me desirable that this case should have a place in the records of this Society because of its unusual features. It was unusual because justice was done so quickly and unerringly, all the processes of the law being swift and sure from start to finish, thus making the affair an exceptional one in its class. It was unusual, also, because of the discreet and

faithful manner in which the dying declaration was obtained, and it is especially for the purpose of presenting this conspicuous example of successful medico-legal practice in a trying situation that this paper is offered.

DISCUSSION.

DR. HOUGH: Although dying declarations are considered with sanctity by not only people in general but the medical fraternity as well, the statements made by persons with full knowledge that they are about to die are not necessarily true. I have had, as medical examiner, one experience of that kind. A man who had been stabbed, having been informed by the Catholic priest in "extreme unction," as well as by myself, and I think two other physicians, that he would die, stated who had inflicted the wounds upon him, and also stated that the attack was entirely unprovoked. Yet it was unquestionably proven in the police court that the homicide had been done in self-defence; that the dead man had assaulted the other fellow with a heavy iron bar or some such weapon, had knocked him down, and that the victim of this assault had stabbed the man who had assaulted him, and that the stabber was about five feet six inches, and the man whom he killed was over six feet. There was no question but that this man said what was not true in the dying declaration.

DR. MEAD: I was much interested in Dr. Draper's case, because conviction came so quickly. My experience has been that, even with dying declarations and confessions, somehow or other the jury pronounce a verdict of not guilty. I had a case where a dying declaration was taken by a physician in a Newton hospital. The man who had performed the operation was brought to the hospital, confronted by the woman and identified, and after that experience and confession the jury acquitted this man, who undoubtedly did the operation. I think that we more often have this experience than that of Dr. Draper in his case.

DR. CANEDY: I have nothing to say in the matter of dying declarations, as I have had no experience in that matter. But the difficulty of prosecuting abortionists is as apparent to medical examiners in the northwestern part of the State as in Boston and vicinity. Near the town in which I live has been a noted abortionist, who has carried on her notorious trade for many years, and it has been known by many citizens that she has carried on this business, and she must have got a great deal of money in that way. The district attorney heard of her, and declared that she should be brought to justice; but it was impossible when the time for the case came to get her to court. She said that she was sick and had to stay at home in bed, and some physicians, members of the medical society, gave certificates of illness, saying that she was not able to attend court. She succeeded in playing this game for a considerable time. In the meantime, a petition was circulated and signed by one-half of the reputable business men of the village in her favor, asking that she be dealt with leniently. This was enough to discourage any district attorney, and it is generally the way that public opinion

runs in all such cases. The authorities, however, finally succeeded in getting this woman into court, and compromised by giving her about a year in jail.

DR. ADAMS: I think that the last gentleman's remarks have struck the real key to the difficulty. A law is not good for much that is not backed up by public opinion and public sympathy, and however people may talk, I fear that that is what the execution of this law lacks — backing of public sympathy.

DR. PRESBREY: I have known a medical examiner to return a case of criminal abortion, and wait in vain for it to appear in court for trial. There is another instance: when we speak of dying declarations I think that we ought to remember that it is not accepted in the court as truth; it is viewed as other evidence, and out of all the discrepancies the truth may prevail. It is the function of the court to separate the true from the false.

A CASE OF PTOMAINE POISONING.[1]

BY H. G. BLAKE, M.D., WOBURN,
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CASES of ptomaine poisoning are reported from time to time in the medical journals and elsewhere, and may become of practical interest to the medical examiner. Most of those cases are mild and escape his attention, but a considerable proportion are fatal, and these are of great interest to him on account of the obscurity that has hitherto involved this subject. Gradually this obscurity is being dispelled, but enough uncertainty still exists to make a record of such cases of great value. The following case suggesting ptomaine poisoning came to my notice as part of my regular work as medical examiner and I will give a brief description of it, as the circumstances under which it occurred are peculiar.

I was summoned by Dr. K., of Woburn, who had been called in the absence of the regular attending physician, October 17, 1898; also, in a short time, by the undertaker through Officer Walsh. I saw the body at 2.30 A. M., Monday, October 7, 1898. A patient of Dr. C., of Woburn, Mary M., thirty-six years of age. There was nothing remarkable about the external appearance of the body. It was lying on a bed, with the head toward the foot. On the same bed was a sister, Kate, lying sick in the natural position with her head on the pillow. She was conscious, in no distress, but weak. Several men, said to be brothers, were in an adjoining room; a married sister and one or two women were in the sick-room.

The statement of the married sister, who was taking care of the girl, was that both were taken sick Saturday evening, October 8th, after a visit to Boston. Their dinner, bought in Boston, and eaten at home about 4 P. M., consisted of one and one-half pounds of raw Bologna sausage, which the girl's prepared themselves and ate alone, the rest of the family being absent. They began to have nausea and vomiting some time that evening (the exact time could not be determined). There was vomiting, no diarrhea, not much pain; later contraction of the hands and feet, vertigo and general depression. They continued sick until Wednesday, October 12th, when Dr. C. was summoned. He considered them seriously sick and made several visits, but found them apparently much better the day before the death of the younger. They were taken worse at night, October 16th, and the younger died at 10 P. M. the same night. The vomitus, which had not been saved (the vomiting having ceased a day or two before death), was said to have been green bile. The clothing had been stained, but was in the wash. None of the original

[1] Read before the Society, June 13, 1899.

food could be obtained. Nothing was seen that was thought suitable for analysis.

Dr. K. stated that he did not quite know whether it was a case for the medical examiner or not, but that he decided to inform me of the case.

In the morning Dr. C. said that he did not think it a case for me, that the case was one of simple gastritis. He had attended the family for fifteen years. The two girls were highly hysterical. They were always together, one never being seen on the street alone. If one was sick the other immediately came down with similar symptoms. When one began to menstruate the other usually came around too. He had repeatedly treated them for nervous symptoms at these periods. They both began to flow the day they were taken sick this time. He had prescribed "pancrobismuth," cream-of-tartar water for the constipation, and for the last few days one-tenth-grain doses of morphine. He had told the oldest (married) sister that he did not like to give morphine, but he finally decided to do so. He had no idea that there was any question of poisoning, and thought I ought not to have been summoned.

The chief of police said the next morning that the girls were peculiar, and were undoubtedly a little unsound mentally. When he heard of the case he said that he had made up his mind at once that they had committed suicide. There was an eccentric strain in most of the family. One unmarried brother was especially peculiar. The chief did not think he was capable of poisoning his sisters. He had no suspicion of any criminal poisoning.

The undertaker was anxious to embalm the body, and I finally gave him permission to do so. The cause of death was given as "probably accidental, due to ptomaine poisoning induced by eating diseased meat."

At 5.30 that night (October 17th) Dr. C. called at my office and told me that the other girl was dead. I went at once to the undertaker's, having decided to perform an autopsy upon this body. To my surprise I found that the girl had died at 2 P. M. and that the body had already been injected. A later interview with the undertaker developed the fact that the embalming fluid contained arsenic and other things not known to him. I decided it to be useless to make the examination under these circumstances.

The mother and father of the girls are dead. They lived with their brothers. A married sister lives in Boston. It was learned that Mary, the younger girl, was to have been married the Wednesday before death to a young man of a different religious faith. There was no property in the family and neither girl had any life insurance.

In considering this case, which I realize is not complete, and which I have reported more as a curiosity and to bring up the subject of food poisoning than to throw any light on an obscure medical subject, several things strike us as being possible: ptomaine poisoning, trichinosis, arsenical poisoning, and morphine poisoning. The failure to perform an autopsy in the first case was due to the statements of the family physician and of the chief of police, and to the fact that the girl had been seriously sick a few years before with an obscure disease, which seemed to show that she might be the subject of some chronic

disease which an acute gastritis might cause to be fatal. In the second case the fault lies with the undertaker, who injected the body before I had been notified.

The facts against arsenical poisoning are the lack of pain and diarrhea, and the long time that elapsed before death. The brother upon whom the most suspicion rested is a person of dull mental power, and it did not seem to any one who knew him that he was capable of such a case of criminal poisoning.

There were no muscular symptoms that would suggest trichinosis.

I was unable to ascertain how much morphine had been taken. This drug undoubtedly influenced the late course of the disease, as the vomiting ceased a day or two before death. The girls were sick four days before they had any morphine at all. The elder girl was conscious of my visit and did not seem to have any of the symptoms of morphine poisoning.

Ptomaine poisoning seems to me the most probable cause of death, and I so stated.

It is now a well-known fact that in the growth of many, if not all, species of bacteria there are developed certain substances called ptomaines, some of which are harmless to the human organism, while others are highly poisonous. These substances may be an excretion of the germ itself, or they may be due to some metamorphosis produced by the germ in the albuminous substance in which it is growing. Be that as it may, the result is the formation of the various forms of toxalbumins known as ptomaine. These are the agents at work in most of the mysterious cases of poisoning by food that are reported from time to time, although we must exclude cases of the disease trichinosis, which has symptoms peculiar to itself but which might lead to confusion.

A scientific classification of these bodies is perhaps impossible with our present imperfect knowledge. According to their physiological action we have the coniine group, the morphine group, the colchicine group, the digitalin group, etc.; or we have a group containing oxygen, produced by known species of bacteria; another produced by unknown species.

Perhaps one of the best known of all the ptomaines is tyrotoxicon, which was first isolated by Professor Vaughan, of Ann Arbor, Michigan. This has been found, in certain conditions, in ice-cream, cheese and milk, and is the cause of many cases of poisoning from eating those foods. It causes retching, vomiting, purging, dilated pupils, rapid breathing, weak pulse and depressed temperature. It is not known by what bacteria it is developed, and its exact chemical composition has not been determined, although it can be obtained in small quantity in crystalline forms by exhaustion with either of the preparations, previously made alkaline, and the spontaneous evaporation of the ether. It is exceedingly poisonous.

Neuridin, cadaverine, and putrescine are well-known substances commonly found in decaying animal tissue, the first being non-poisonous, the last two moderately so. Cadaverine is identical with the so-called animal coniine and coniine-like ptomaine. Its chemical name is pentamethylenediamine and it can

be prepared synthetically. It is closely related to putrescine, which is tetramethylenediamine.

Neurin, choline, and muscarine constitute another group of ptomaines that have been obtained from putrid meat, mushrooms, etc. They are all very toxic and are closely related chemically.

Other poisonous principles have been isolated from cultures of the typhoid and tetanus germs. Allied to these ptomaines are the various snake venoms and certain vegetable toxalbumins, such as abrin and resin, the latter from the castor-oil bean.

The chief interest of these poisons to the medical examiner is the fact that such poisons exist in food under certain conditions, and that they give rise to symptoms resembling those caused by some of the well-known mineral poisons. Therefore it is impossible to say merely from the symptoms that we have to do with such and such a poison, but the autopsy and the chemical examination alone can give us the proof that we desire. Thus, in the case I have given the failure to make an autopsy leaves us uncertain and makes the case incomplete; and the point I wish to bring out (a point that has been emphasized before this Society) is the desirability of performing an autopsy in all cases of suspected poisoning, however slight may be our suspicion.

DISCUSSION.

DR. ADAMS: It is comparatively a short time since we have heard anything of poisoning by ptomaines — I mean fatal poisoning. I cannot recall any precise definition of it which would enable me or any one else to distinguish a case of ptomaine poisoning from a case of poisoning by arsenic — I mean in the clinical history.

DR. ABBOTT: A distinction between the two might be said to be that arsenic poisoning is very often fatal, while ptomaine poisoning is very seldom fatal.

DR. CANEDY: I was very much interested in the reading of this paper, as it suggested to my mind an experience that I have had with trichinosis. There were some 12 or 15 cases in all, three of which were fatal; some recovered after quite a long illness. But these cases were quite similar to those in the paper. The sickness was short and very acute, beginning after eating, and these cases were traced to sausage, soon after ingestion of which they were taken with vomiting, with severe diarrhea; the patients were sick a few days,with elevated temperature, gastro-enteric pains, frequent and rapid pulse, and little could be done to arrest the progress of the case, which proved fatal to three patients. The remaining eight, or 10, or 12, recovered after a long illness, and some have hardly recovered yet.

My experience with ptomaines has been that while the case is severe, the patient soon recovers, and I should not expect a case of ptomaine poisoning where death followed after a week's illness.

DR. ADAMS: I will state a case in which the diagnosis was made, by the attending physician, of ptomaine poisoning. When the symptoms

were related to me they seemed to indicate arsenic poisoning, and I so declared was my opinion. On making a post-mortem examination I found distinctive indications of arsenic poisoning, and I sent different parts of the body to Dr. Wood, and he sent back word that it was undoubtedly a case of arsenic poisoning. The symptoms were very much as already described in the case of Dr. Blake, and the termination was fatal. The condition, which came on at the end of about four days, was that of rapid collapse, terminating in death; it was that circumstance that induced me to say arsenic, since, if it had been a case of ptomaine poisoning, the patient would have got well instead of dying suddenly in collapse. The peculiarity was, after the preliminary symptoms of purging and vomiting, with that terrible burning in the pit of the stomach, there was a time when the patient was quite easy; he could take food without any purging or vomiting, and that continued for two or three days, when there came on again violent vomiting, retching, burning pain at the pit of the stomach, and the man died suddenly in collapse. I think that in the history of arsenic poisoning that is not a very unusual course; that the cases generally terminate within forty-eight hours; that there is a time when the symptoms seem to cease.

I remember having a case of a man who drank a quantity of Paris green and who lived nearly three weeks, and a part of that time believed that he was going to recover, but he finally died in collapse. This man took all the poison at one time. The doctor insisted upon it that this man must have taken a new dose of arsenic, which must have brought on recrudescence and must have caused death. At the autopsy I found that peculiar condition of the liver — that pale yellow, fatty look — so marked that I could not have supposed it to have happened within twenty-four hours, but must have been a thing of slow development. There were crystals of arsenic in the stomach and intestines and a very large quantity in the urine; I was able to draw from the bladder only a few drops, and found one-sixtieth of a grain of arsenic in that small quantity of urine, which was considered a large quantity of arsenic. I sent the liver, stomach, intestines and brain, and arsenic was found in all these organs. It seems to me that the urine is the most important material; next to that, perhaps, the liver. The poison is entirely eliminated from the stomach and a good portion of the intestines by violent vomiting, if, since the ingestion of the poison, a considerable time has elapsed, perhaps three or four days. The only interesting point of this is that it was called a case of ptomaine poisoning and the only diagnosis which could be made before death; there was hardly a possible diagnosis from the clinical symptoms until death occurred in collapse, which would not have appeared if it had been ptomaine poisoning.

Dr. Abbott: I have had opportunity to see four or five cases of trichinosis. All of these except the last three were in the families of foreigners, either Swedes, Germans, Hungarians, or French Canadians; but what I want to bring to your attention is that there is one quite distinctive symptom, and that is extreme muscular tenderness; I never saw a case in which that

was not pretty well marked. I have seen a young college student all drawn up in bed, very sharp pains in his legs, his tongue so stiffened that he could not speak, and it hurt him to open his eyes and he could not open his mouth. These muscular tendernesses are due to infiltration of the muscles with this parasite. Three members of his family were taken ill, in the case of the college student; his two little brothers also ate of the ham which caused his illness, but were not so sick, as they did not eat in similar quantities.

Dr. Adams: In confirmation of what Dr. Abbott has said, it has recalled to my mind three cases of trichinosis which occurred in Saxonville thirty years ago. They were all marked with intense muscular tenderness and pain; muscular movements were very painful and it was almost impossible to move the arms or legs.

A REPORT OF MEDICO-LEGAL AUTOPSIES.[1]

BY FREDERICK H. BAKER, M.D., WORCESTER,
Medical Examiner,

THESE autopsies are reported to the Society not with the idea that they are unique or rare, but rather as excellent types of cases that medical examiners are called upon to investigate.

CASE I. *Acute alcohol poisoning.* — Male, twenty-five years of age, laborer, accustomed to moderate drinking, while apparently in perfect health drove with a friend about four miles to a neighboring town, entered a saloon where he made a wager that he could drink a pint of whiskey within ten minutes. About one and one-half pints of presumably cheap whiskey was brought to him in six glasses. He drank the amount in less than five minutes and soon after started for home. On the way he became unconscious, vomited, and was in a comatose condition upon his arrival. He had four or five convulsions, his face was livid, he breathed heavily, and died in six hours without regaining consciousness.

His parents and brothers claimed that he was the victim of "knock-out drops," and demanded an investigation. The case occurred out of my district, but I was called in by Dr. L. White, associate medical examiner of Uxbridge, to perform the autopsy.

Autopsy. — Thirty-six hours after death. The body showed no evidence of decomposition. It has been observed that decomposition sets in slowly in cases of alcohol poisoning. He was exceedingly muscular, of medium height, and weighed about one hundred and sixty-five pounds. Rigor mortis, with very extensive post-mortem mottling and discoloration, was present. The pupils were dilated five millimetres and equal. There were no marks of violence upon the body. There was much engorgement of the sinuses and of the pia, the puncta cruenta were very prominent and the whole brain was edematous. There were about 50 cubic centimetres of a slightly reddish serum in each pleural cavity.

Both lungs were distended, markedly engorged, and exceedingly edematous, with their lower portions dotted with numerous pleural ecchymoses, such as are seen in death from suffocation. The trachea, larynx and bronchi were injected. The pericardium contained about 100 cubic centimetres of yellow serous fluid. There was nothing remarkable about the heart or the appearance of the blood. The esophagus was of normal appearance.

The stomach contained 237 grammes of brownish-black, faintly acid, liquid contents, which had a slightly alcoholic odor. In it were partially

[1] Read before the Society, June 13, 1890.

digested bits of baked beans, potatoes, and particles of fat, etc. The wall of the stomach was slightly swollen, with the mucosa only moderately reddened, with small, dark hemorrhagic areas here and there. The upper part of the small intestines was slightly reddened but not remarkably so. The liver, kidneys and spleen were engorged, but otherwise of normal appearance. The bladder contained a considerable amount of urine, which contained a small amount of blood.

Cultures on blood serum taken from the heart's blood, liver, spleen and kidneys remained sterile, as would be expected. The stomach with its contents, the liver, spleen and kidneys, and a portion of the brain, sealed and in separate jars, were taken to Prof. L. P. Kinnicutt, of the Worcester Polytechnic Institute, for examination. He reported that "the stomach was found to contain 14½ cubic centimetres of absolute alcohol, and in the portion of liver examined an amount that would give for the whole liver 3½ cubic centimetres. No other poisons were found in the stomach contents or organs. Microscopical sections of all the organs were made and each one found normal in appearance."

This is a case where to my mind, after hearing the circumstances, the diagnosis was clearly alcohol poisoning, yet so strong was the feeling of the family and the town authorities that an autopsy was deemed right and proper.

CASE II. *Suicide; prussic acid poisoning.* — Female, twenty-one years of age, attendant at Worcester Insane Hospital, was accused by the hospital authorities of having stolen clothing from the institution. She was given over night to make a confession of what she had stolen, and where she had disposed of it. In the morning she made a partial confession, and it was decided to search her trunk. While this was being done in her presence, she suddenly poured the contents of a small bottle into a small tin box and drank it all. She made one exclamation and almost instantly fell to the floor, and became unconscious at once. She had very severe tetanic convulsions, her face became dusky, and she died in about twelve minutes, notwithstanding medical attendance was immediately at hand and her stomach was washed out. From certain peculiarities attending the case, the district attorney decided that an autopsy should be performed.

Autopsy. — One hour after death. She was well developed and nourished. Face slightly cyanosed, moderate post-mortem discoloration. The lips, tongue and mouth were slightly eroded and a very faint odor of prussic acid could be obtained. The pupils were widely dilated. The mouth and nostrils were frothy. When the cranial, thoracic and abdominal cavities were opened, a distinct odor of prussic acid was noticeable.

The mucous membrane of the stomach and the upper part of the small intestines were bright red in color, swollen, intensely injected; the lower part of the small intestines was not remarkable. There was a moderate engorgement of the brain, liver, kidneys and spleen. The lungs were much engorged and edematous and there were numerous subpleural ecchymoses. The heart was not remarkable. The blood was everywhere very fluid and a striking

characteristic of it was its cherry-red color and marked odor of prussic acid; a few cubic centimetres of it in a stoppered bottle retained this color perfectly for several months.

The stomach contents were examined by Professor Kinnicutt and prussic acid was found. The blood gave the reactions also for prussic acid. The spectroscopic examination gave only the absorption bands of oxyhemoglobin.

CASE III. *Acute hemorrhagic pancreatitis.* — Male, laborer, twenty-nine years of age, drove into Worcester from a neighboring town with a friend and both drank heavily during the afternoon. When returning in the evening the deceased fell out of the wagon and was left behind by the roadside. An acquaintance found him and picked him up. He supposed that he was "dead drunk," and when he reached his home, left him in the wagon in a shed, as it was warm weather. He found him dead in the morning.

The autopsy showed him to be a well-built man. There were a few abrasions on the forehead and both cheeks and nose, presumably caused by his fall. No marks upon the rest of the body. The interesting condition was found in the pancreas. Upon opening the lesser omental cavity, there appeared an extensive blood clot occupying the site of the pancreas. It wholly covered and infiltrated it, and here and there were seen areas of fat necrosis. There was clotted blood in the pancreatic duct. No ruptured vessel could be found, nor was there any rupture of any muscle or other organs. All the organs of the body were normal, though slightly engorged. The stomach showed a considerable degree of injection, as did the small intestines. There was a moderate degree of atheroma of the large blood-vessels.

Whether this pancreatic hemorrhage was due to alcohol or trauma, or both, I am undecided. Possibly neither. It is an interesting pathological condition as a factor in sudden deaths.

CASE IV. *Peculiar death from a blow upon the head.* — Male, fourteen years of age, was struck on the back of the head near the occipital protuberance by the wheel of a boy's express cart, thrown at him in anger by an older boy. He received a horizontal scalp wound about one inch in length, but was not rendered unconscious. He was out of doors during the greater part of the next three days, but did not feel well. He vomited several times and the evening of the fourth day became suddenly ill and delirious, dying the following morning.

The autopsy showed an infected scalp wound, a considerable diffused hemorrhage over the surfaces of the lobes of the cerebellum, with infiltration into it, and an acute purulent meningitis. There was no fracture of the skull. The meningitis was caused by the streptococcus pyogenes and staphylococcus aureus.

This case shows how symptoms may be delayed in a fatal head injury. His assailant was indicted for manslaughter, but he was put on probation by the court.

CASE V. *Death from an unknown cause.* — Male, thirty-five years of age, farm laborer, came into Worcester and had a few drinks of beer. A

few hours later he was found dead on the floor in a bath-room in a house of questionable reputation. They stated that as he was passing along the street he was taken with severe abdominal pain, vomiting and diarrhea; he was taken in and died a few moments later. He certainly vomited all over the bath-room.

The autopsy was made two hours later. He was of unusual muscular development. Aside from a slight hyperemia of the lining membrane of the stomach and small intestines and the abdominal viscera, everything was normal in appearance. All the organs and stomach contents were subjected to a chemical examination by Professor Kinnicutt. Everything that could be thought of was searched for, but with the exception of a slight trace of alcohol, nothing was found. The only possible reason for death that could be given was that in some way the Brazil nuts which he had been eating were the cause. Particles of these nuts were found partially digested in the stomach, but chemical examination threw no light upon it. Careful cultures and microscopical sections were made from every organ, and from the nervous system, but the results were negative. The autopsy was done in a well-equipped hospital morgue; every possible pains was taken with it, as its puzzling character was realized at the time. The spinal cord was removed, the pulmonary artery examined *in situ*, the arteries of the brain examined carefully. The alimentary tract was examined from the tongue to the anus, but no lesions were found.

It is decidedly interesting for the strong negative character which it has; yet interesting and instructive as it may be, it is of such a kind that one is better than many as far as our medico-legal pride is concerned. This case certainly had the appearance and history of that of a strong irritant poison.

DISCUSSION.

Dr. Presbrey: I should like to mention a case suggested by one of those reported by the reader. The mother of a little child was cleaning silver with solution of cyanide of potassium; the mother's back was turned, and the little one took up and swallowed some of the poison. As the mother knew the danger, and it is only a short distance to my house, she sent for me. Knowing the seriousness of the trouble I went immediately. There was an interval of ten minutes from the time that the child took the poison until I got there, and then the child was cyanotic and died within a very few minutes.

Dr. Paine: The 1st of January, 1898, I was called to a young fellow who had been found lying by the roadside. He was taken up and brought to the police station; when I got there he was dead. They picked him up alive and he lived a few moments and had great trouble with breathing. At the autopsy the face was gray, there was no odor from the mouth at all of prussic acid and the appearance was negative. But I took the stomach and liver and other organs to Professor Wood; the next day they began to show cherry color, and Dr. Wood said that he was positive there was some

poison there. The dead man had had some trouble that had been weighing upon him a good deal and he had told a doctor that he was going to commit suicide. He had said, "I know that I can take prussic acid and no one will know that I am going to die, or what has been the cause." Where he was lying in the road they found large quantities of cyanide of potassium.

Dr. Hough: I will relate a case of poisoning by cyanide of potassium — that of a bank cashier, who had been using the bank's money, and found that he would be discovered. From the bank he telephoned the family physician, saying, "Doctor, I wish that you would go up to my house and tell my wife that I am dead," or words to that effect. The doctor said, "Why, what do you mean?" "That I am going to kill myself." The doctor said, "Do not do it; where are you?" He replied that he was at the bank. The doctor ran to the bank; he got there in less than five minutes and the man was dead. In that case there was a distinctive odor about the mouth of the dead body of ammonia, as I think will frequently happen. It was not the real cyanide odor, but rather ammoniacal. If any have had experience with cyanide of potassium, they will know that the bottle in which it has been kept does not have a real cyanide odor, but a somewhat ammoniacal odor, similar to that produced by cyanide of ammonia; if any one is familiar with that peculiar ammonia smell — not straight ammonia — it is just as good evidence as the straight smell of cyanide of potassium.

INSANITY AS AN EXCUSE FOR CRIME; REPORT OF A CASE.[1]

BY JAY PERKINS, M.D., PROVIDENCE, R. I.

MR. PRESIDENT AND GENTLEMEN OF THE MASSACHUSETTS MEDICO-LEGAL SOCIETY: — It is, perhaps, presumption on my part to bring before you the subject which I have to-day, for I fully realize that I am not an alienist and am very poorly equipped to discuss questions relating to insanity. I come before you simply as a student of legal medicine, but in legal medicine, as I am by experience fast learning, the question of sanity and insanity is becoming of more and more importance, and unless we who are doing general medico-legal work are willing to bow submissively to the expert alienist, we must consider the subject by ourselves, and it is in this attitude that I present this case and discussion before you to-day.

Much has been written and said as to the medical-expert witness, and I will be brief in giving my opinion of him and his attitude towards the case. In the last quarter of a century the science of medicine has in many ways made a phenomenal advance, and things whichtwenty-five years ago would have been looked upon as wholly fanciful are to-day undisputed and form part of the basis of all our work. This is true of many of the theories of the past; they are now facts; but this is not true of all of the theories of the past, many of which are now never mentioned. In medical discussions in society meetings, it is well to give all new and advanced ideas, as there they will be discussed by medical men and their truth or falsity can be properly estimated; but in courts of law, where often the only hope for the lawyer for the defence is to make but a disagreement of medical experts, we should be more conservative. Theories or suspicions, especially when advanced by a man of reputation as facts, may, and often do, give to a jury sufficient cause for a reasonable doubt, and thus do much harm to the cause of justice and destroy confidence in medical witnesses.

The aid of lawmakers has been invoked to bring the medical witness into better standing by giving the court the power to appoint experts. We have a very good law of this kind in Rhode Island, but you cannot make a set of experts into a jury, as you would be doing if you made their decisions final. They must be cross-examined and this cross-examination will bring out differences unless they are conservative and hold only to that which is well known. Then, too, you cannot prevent the lawyer from putting on independent medical witnesses. So this matter cannot be fully regulated by law any more than you can reform a drunkard by law. Laws may help, but the real reform

[1] Read before the Society, October 4, 1899.

must come from the physicians themselves, and the medical witness should in no sense be a partisan or advocate.

In the trial which I am about to report the prosecution had three, and the defence five, physicians, for the most part well-known and eminent men in the profession, who were advising the attorneys as to what questions to ask. As to the propriety of this, I am in doubt. How far does our duty to the case go in this respect and where does our professional honor demand that we desist? Especially with us as medical examiners: what is our proper attitude to the prosecution?

There is no class of cases in which all that has been said is truer than where there is the question of sanity. Psychology is an extremely complex science, and when one of Massachusetts' leading psychologists, whose writings are frequently quoted, goes before the Legislature and prevents the passage of a law which limits the substitution of ignorance and superstition for knowledge and science, and does it through reasoning from his psychological tenets, are not we, who are trying to do scientific work, justified in asking for some good proof and evidence of these tenets and the deductions therefrom, instead of blindly accepting them?

On the night of February 12, 1899, I was called, in my capacity as medical examiner, to the house of Mr. Amos D. Palmer, in Cranston, R. I. The house is just beyond the city line, but the examiner for that district could not be found. I arrived at the house at 11.30 P. M., and then learned that Mr. Palmer and his wife had been celebrating the eighth anniversary of their marriage on that day. Four guests, two ladies and two gentlemen, had been present. At about five o'clock the gentlemen went to the billiard-room, where they remained until 8 P. M., when they went down stairs, and soon after the guests went home.

The history of the case for the next few hours, I give as I learned it that night and from notes taken at the time the statements were made to me by the servants, and not just as it was brought out at the trial, as I believe the former to be the more accurate.

After the guests were gone, Mr. Palmer went down into the basement, as he said, to fix the furnace; when he came up he and Mrs. Palmer had a light lunch, during which they had a quarrel concerning his going down to fix the furnace, Mrs. Palmer claiming that what he went down for was to get some liquor, and that he should let John take care of the furnace. The cook told me that he was evidently under the influence of liquor at the time they had the lunch. (At the time of the trial the cook could not remember any such condition.)

Mr. and Mrs. Palmer went upstairs about nine o'clock. At 9.15 the two servants, Mary Farrell, the cook, and Margaret Sullivan, the second girl, were in the room over Mr. Palmer's and heard sounds like "knocking," and heard Mrs. Palmer scream three times. The cook went downstairs to the first floor, and walking through the rooms of that floor heard Mr. Palmer talking, but did not know anything that he was saying. She went back to her room again,

and in about ten minutes Mr. Palmer called to her; "Mary," and upon her answering, said, "Did you hear that?" She asked, "What was it?" and he said, "I fear I have killed her." When she found that Mrs. Palmer was dead, she said, "Oh, Mr. Palmer, what have you done?" He replied, "She tried to kill me first," and then said, "Oh, what have I done; what have I done?" Mrs. Palmer was then lying with her head on a hassock. Both Mr. and Mrs. Palmer were dressed in night clothes and blanket wraps.

The cook then called the coachman, John Devine. When he reached Mr. Palmer's room, Palmer was naked, having taken off his night-dress, and was apparently preparing to dress himself. At the time there was nothing said as to any frenzied condition, though the counsel tried to draw this out at the time of the trial. He did say, however, that Palmer went to a drawer and took out a revolver and wanted to load it in order to kill himself, but was restrained by his coachman. There were two revolvers given to me after my arrival at the house; one contained empty shells, five of 32 calibre, and presented evidence of having been recently fired; the other was empty and had not been recently fired, and, as was afterwards shown, it was not in good working order. He kept these in different places, and had gotten the loaded one first and to use in shooting his wife.

Palmer then telephoned to his physician, Dr. Carr, and told him that he had shot his wife. Dr. Carr was not able to go, and asked Dr. George D. Hersey to go in his place. Dr. Hersey went out, arriving there at a little before eleven, and about two hours after the shooting. Palmer was then fully dressed and met him on the landing of the stairs. After Dr. Hersey found that Mrs. Palmer was dead he told Palmer so, and he then became somewhat excited and again said he wanted to kill himself. He repeatedly stated his desire to commit suicide.

I arrived at the house at about 11.30, and saw Palmer a moment then, as he was sitting quietly on a sofa with Dr. Hersey. I went into the room where his wife's body lay and made an examination of it. Dr. Hersey came in with me, but in a few moments we heard scuffling, and the coachman said Palmer was trying to kill himself by taking some poison. Dr. Hersey then stayed in the room with him.

After examining the body, I telephoned to the chief of police and went in and talked to Mr. Palmer and was then with him much of the time for a couple of hours. His breath smelled strongly of liquor, and upon questioning him as to what had occurred he claimed that he could remember nothing from the time he and his guests were in the billiard-room until after Dr. Hersey arrived. However, he certainly seemed to realize what he had done and repeatedly exclaimed, "Why did I do it; why did I do it? I couldn't have done it." At no time, however, did he seem to doubt that he had killed his wife. When we stopped talking, he would walk across the floor with his head slightly bowed and an anxious expression upon his face and then say, "Why did I do it; why did I do it?" Upon questioning him as to why he did it, he said that all that he could lay it to was the whiskey and beer that he had drunk; that

he had had four drinks of Mount Vernon whiskey and several bottles of beer; he ought to have known better than to have drunk that whiskey, "as Mount Vernon whiskey always did him up." He told me that he drank the whiskey when he went down to fix the furnace, and drank the beer in the billiard-room. He said that he and his wife lived happily together; that "they had their little quarrels as everybody does," but that they made up and were happy again, and he could remember of no quarrel this night. All of the time he talked rationally, but would have, apparently, great remorse when we stopped talking. I saw nothing, however, to indicate any frenzied condition and certainly no stupor or mental abstraction. It was impossible to get his mind off from what he had done. If we talked about anything else, the moment we stopped talking his mind went back at once to the shooting. He said that he was a murderer; that he would give himself up to the police. He said this before, as well as after my arrival.

When the police arrived and rang the bell, before he saw them he said, "There comes the police; it will be a charge of murder."

At about eleven o'clock, Dr. Hersey gave him 30 grains of bromide of soda and at twelve o'clock another 30 grains. He became somewhat quieter and calmer after one o'clock; though, as previously stated, there was nothing approaching a frenzied condition — certainly not after my arrival.

Between four and five o'clock, when in the presence of the officers, he vomited, the vomitus smelling strongly of liquor.

At about the time I notified the police of the murder, Dr. Hersey suggested to Mr. Palmer that it would be well perhaps for him to notify his lawyer of what had taken place. Mr. Palmer told him his lawyer's name and Dr. Hersey telephoned.

It was an intensely stormy night and the officers stayed at the house all night, taking Mr. Palmer to the court the next morning. He had slept none, and ate no breakfast. He was somewhat nervous at the court, and at the suggestion of his lawyer pleaded "Not guilty," but on leaving the court-house for the prison, he said, "My God, I am a murderer."

The next morning I turned the case over to the medical examiner of that district, Dr. A. H. Longfellow, and he made an autopsy, at which I was present. There were six bullet wounds, five of entrance and one of exit. One bullet entered the left arm just above the wrist on the back side and there was a corresponding wound of exit higher up on the inside of the arm, and the bullet was found caught in the sleeve of the night-dress. There was a bullet wound at the lower border of the left nipple; another three-quarters of an inch lower and a little to the outside; another three inches diagonally below and outside the nipple, and another three inches above the nipple. One bullet went straight in, passing through the heart and the root of the right lung. The others had a downward tendency, some more, some less; but all passed through some part of the stomach. One bullet was imbedded in the left loin. There were corresponding openings, about which the loose wool was much burned, in her blanket wrap.

By subsequent examinations, I found that the revolver was held at a distance of not less than five and not more than ten inches from the blanket wrap, and from the relations of the holes in the burned areas I determined that if the revolver was held as is usual, one of the shots was fired with body erect and the others as it was falling. This was determined by the holes being on the trigger side of the burn.

There was no disarrangement of the furniture or anything about the rooms which would indicate any struggle. Dr. Hersey and I remained at the house all night, and neither of us had any doubt but that Mr. Palmer's condition was due to alcoholism and remorse.

Now let us look briefly at Mr. Palmer's earlier life so far as it is known. Most of those associated with him, and all associated with him intimately, are dead. His father died when he was about eighteen months of age, and from that time until he was a man grown he was almost exclusively with his mother or nurse until the death of the former in 1890. Their family physician during his childhood and his nurse are also dead, so that his early history is not very definite. His mother never sent him to school and never allowed him out of her sight, or that of the nurse, during his childhood. He never associated to any extent with any other boys, as they did not enjoy his company enough to come to him, and his mother would not let him go from home. There is no doubt but that there was some good reason for this. The defence claimed that the reason was, attacks of epilepsy. The evidence on this point was not over strong, but some light attacks of epilepsy were fairly established, the best evidence being that of a barber. The evidence does show that his mind was not fully developed and there is other evidence which was not introduced into court which shows a marked mental deficiency, but it seems to me that there is still a chance to question whether the attacks introduced were really epileptic or whether they were merely manifestations of an undeveloped mind. The evidence was skilfully handled with a view of showing that he had epileptic seizures. All of the witnesses for the prosecution, excepting those on the case officially, had been skilfully brought into an extremely sympathetic attitude to the prisoner and were practically witnesses for the defence.

When sixteen years of age he was in Florida with his mother and there began to drink liquors, which habit he kept up to the time of the homicide. About two years later, after a summer at Narragansett Pier, he had an attack of delirium tremens, and drank very hard until within about three years of the homicide, during which latter interval he drank less, but still considerably.

In 1891 he married, without his mother's knowledge, a divorced woman whom he had known intimately for several years. It was at about this time that his mother died and he now passed from his mother's influence to that of his wife. He loved her passionately, and, as I think is usual when the higher faculties of the mind are dwarfed, the emotions and animal passions stood out more strongly. As had the mother, so now the wife possessed the stronger mind, and when he was not under the influence of liquor she ruled his weaker

mind easily. He was, however, at times jealous of her and apparently not without cause. They always had quarrels, and about five years ago he had shot at her, the bullet striking the bed. One of the servants reluctantly acknowledged she had heard him threaten "to throw her down stairs and break her neck."

In recent years the only thing that they could bring up to show a tendency to epilepsy was his falling off from his wheel one day while out bicycling with his wife, and at another time while riding in a carriage he had a severe headache, becoming partially unconscious, but this evidence was very shaky.

When Mr. Palmer was on the stand he claimed that while in jail he woke up several mornings with his tongue sore and swollen and bloody foam in his mouth, which was, however, never brought to the attention of the physician, and, in fact, his lawyers would not allow him to see the physician of the State institutions whom the State desired to have examine him.

While on the stand Palmer answered the questions more intelligently than several of the other witnesses and was attentive throughout the trial. He claimed that he could not remember when the guests went home the night of the shooting; he could remember bringing the beer up to the billiard-room but could not remember drinking any of it (though that night he remembered it distinctly), and the next thing he could remember was, "I remember bending over my wife, who lay on the floor in my bedroom and remember lifting her head on the hassock and exclaiming, 'My God, she is not dead!' " This all faded out like a dream, and the next thing he remembered was being in the sitting-room and two gentlemen coming in, "one of whom must have been a doctor, because he gave me something bitter to take," and after a long time two other men came in. He also remembered his dog coming in and lapping his hands and face, and later of having a cup of coffee which made him sick. He claimed that the first that he realized that anything was wrong was "when the officers were there and one of them kept dogging him around"; then he recalled going to court and to jail; all the rest he said was a blank, yet he remembered that his wife had on a light blanket wrapper, as brought out on the cross-examination, though he claimed in answering his lawyer's questions that he could not remember his wife's face.

In relation to attacks of epilepsy, he testified with a good deal of minuteness to attacks which he had had. The first he could remember were when he was eleven or twelve years of age; they came on with an "all-gone feeling and a queer feeling in the head," and he lost consciousness. After coming out of the spells he would be in a kind of stupor. He could remember the time he fell from his bicycle; he was not feeling well in the morning, ate little breakfast, and started on the ride soon after breakfast. He did not at any time lose consciousness, but felt dizzy and fell from his wheel, but with his wife's assistance he got out to one side of the road and rested for about half an hour, after which they went home slowly, he feeling "used up."

He remembered having delirium tremens and getting so drunk he could not walk steadily on a number of occasions; that sometimes the boys put

him to bed. One time after drinking champagne he was taken to the City Hotel and put to bed, not knowing where he was when he awoke the next morning, but this knowledge came to him gradually.

The physician who attended him in recent years knew nothing of any epileptic attacks; he had attended him after some of his drinking spells and told him as a means of frightening him, that if he did not stop drinking they might have to put him in an asylum.

As before stated, all of the witnesses, even those for the prosecution, had been brought to a very marked degree of sympathy for the prisoner, and this was so evident in the change in the testimony of those with whom I talked the night of the shooting, that I could not place much reliance on what most of the witnesses had to say as to details. One of the witnesses testified that he saw him have spells when a boy and that he frothed at the mouth. Under cross-examination, however, he acknowledged that he had not thought of the frothing until the attorney for the defence had questioned him on that point at some time before the trial and fifteen to twenty years after the occurrence. This sympathy for the prisoner extended to the relatives of the dead woman, one of whom, a sister, kissed Palmer one day in the court-room. The servants were all kept at the house on good pay until after the trial, and the reputation of his wife gave him much sympathy from the public in general. The most of the evidence put in by the defence was of little real value. There was one witness, a barber, however, who testified that he had seen Palmer in attacks of epilepsy while getting his hair cut. On one of these occasions his eyes bulged out, he became purple in the face, grew rigid and cried out, "Oh, oh, oh!" His mother then took him, and the hair-cutting was completed two or three days later. The barber then testified that Palmer would sometimes take up some of the hair that had been cut off and say, "Isn't that funny hair; look at it jump; it is alive"; and sometimes would complain of the furniture moving about the room. Also during some of the attacks which Palmer had while his hair was being cut, and in which he lost consciousness, he was sitting in a straight-back chair and yet he never fell out of the chair.

I believe that what I have said will give you a fair idea of the case and the character and substance of the testimony. The defence had not put in all of its testimony, when it was agreed that the experts on the case should confer as to the prisoner's sanity or insanity. This they did, and at the next session of the court, the following statement was presented:

WILLARD B. TANNER, ESQ., *Attorney-General:*

Dear Sir, — We, the undersigned, having examined Amos D. Palmer as to his mental condition, with reference to the indictment against him for the killing of his wife on the night of February 12, 1899, hereby report that we jointly agree in the opinion that he is the subject of mental disease, and that the act was committed under the influence of that disease; and, in our opinion, is therefore not responsible for his homicidal act and that proper measures should be taken to protect him and the public from further consequences of his mental disease. Signed: P. M. Wise,

C. P. Bancroft, G. F. Keene (experts for the State) G. F. Jelly, Edward Cowles, Walter Channing, W. H. Palmer and F. H. Peckham, Jr. (experts for the defence).

The prosecution and the defence then both asked that the jury be instructed to bring in a verdict, "Not guilty by reason of insanity." The court, however, stated that it could not direct the verdict, and suggested that an expert be put on the stand from each side that the jury might bring in a verdict from evidence.

All of the experts were placed upon the stand; their evidence was in conformity with the statement made in writing by all, excepting that the defence laid stress upon the epileptic element, Dr. Channing going so far as to say that "he was probably in an epileptic condition at the time of the homicide."

There was evidence presented to the experts showing the weak mind, which was not of a character to be presented in open court, but I am informed there was nothing of any weight as to epilepsy; all agreed that the nature of his mental affliction was imbecility, and in this I certainly agree; and I approve fully the finding of the jury, "Not guilty by reason of insanity."

Dr. Bancroft testified, in part, that Palmer possessed a defective will power and at the time he committed the act he was unconscious. What alcohol he took may have aggravated this condition, but under it all lay the fact of his imperfect mental condition; that he was a congenital imbecile and that the disease was incurable and progressive. It seems to me that this covers the case and is all that is justified by the evidence when carefully sifted and considered.

In all of our work I know that it is hard not to let our judgment be swayed by our sympathies and our sympathies go to those whom we are trying to help, and though it is not always easy to form or express just judgments, if there is any one in the world who needs to be just and fair, it is the medical expert, yet we all know to what depths he has fallen in many cases in the opinion of the courts and his brother physicians and the people in general. Much of this feeling is certainly unjust, but not all of it. It is impossible for the courts or the laity to keep abreast of the advance in medical knowledge. Law is built upon precedent; medicine is always reaching out towards the unknown, and at each advance tries to make use of all it can reach, and each day sets new standards, which unfortunately do not always bear up under the weight of new structures. They have not been properly tested, and when used, break under the burdens they should bear if sound, or perhaps break because they are not made for the burdens which are placed upon them. It seems to me that this is the condition of expert testimony on "insanity as an excuse for crime" to-day. The alienist has given us much new material in his line, but is he not sometimes too much flushed with his successes and not calm enough in his opinion? There are gynecologists who can find but few healthy ovaries, and but few ovaries are removed post mortem which are absolutely normal, yet every woman should not have ovariotomy performed because she has a pain in the side or back. There are a great

many persons who do not come up to the physical standard set by Dr. Sargent as the normal, and yet they are able to do good work, though some will not work. There are but few minds which upon careful examination are at the standard of perfection, yet all these are not insane even if they do what some people consider insane things. In judging of a person in a doubtful case many things must be considered, such as his education, environment, habits, efforts at self-control, and in fact his whole life.

Insanity is now the defence resorted to in all cases where there is no other, and an able counsel can do much to establish insanity in many cases where there is no insanity, the enthusiastic and sympathetic expert helping him. In the case I have related the experts were particularly eminent and honest. Those from Massachusetts you all know better than I, and I know them well by reputation and know nothing against them in any way, and for the very reason of my opinion of them, I have studied this case and their evidence and acts, yet I cannot come to agree with them in all they have said. Was this man Palmer in an epileptic condition at the time of the homicide? I will not review the case farther than to recall a few features. He had been drinking a strong liquor which he said was "always too much for him." He knew enough to know where to go for the loaded revolver first, and later for the other. Ten minutes after he had done the shooting, he told the servants that he had killed his wife, but that she had tried to kill him first. Have you known of an epileptic murderer pleading self-defence? Then he wanted to commit suicide. Do epileptics commit suicide while still under the influence of the seizure? He and his wife had a quarrel about his drinking but a short time before the shooting. He had shot at her before and had threatened her. There was no stupor, no absolute forgetfulness. He remembered bringing beer into the billiard-room, he remembered putting his wife's head upon the hassock after killing her, he remembered the doctor and other men coming in, he remembered his dog, the coffee, leaving the house, and yet he could not remember the most of what had taken place that night. At no time after the shooting could his mind be kept from it, and if drawn away, would go back almost at once. He could talk rationally during most of the time he claimed everything was a blank. His breath smelled strongly of liquor and he vomited liquor. He had a mind which was congenitally weak. Now, gentlemen, granting even that he had epileptic attacks during childhood, do these things indicate epileptic seizures, or an epileptic condition at the time of the crime, or was he in a subconscious condition due to the action of alcohol on the weak mind?

It is true that a person may have attacks of epilepsy only few in number and very slight, and then be free from it for a long time; then in an epileptic condition commit murder of which he is wholly unconscious and cannot believe. Probably men have been hanged for murder while protesting their innocence though guilty, because the murder was done under the epileptic influence, but is this a sufficient reason for saying that a murder was done during an epileptic condition because the man has had an epileptic seizure at some

time during his life? There is no reason why an epileptic may not get under the influence of drink and do as others have done who never had an epileptic seizure. I know that cases are reported where a man has had but one or two epileptic seizures during his life and has committed murder during one of these, but is it safe to draw marked inferences from this and to be ready to support the belief of epileptic homicide in all cases where the person has had an epileptic seizure earlier in life, unless all the indications point that way? It is easier for a man who has shown no signs of insanity for some years to get out of an asylum than for a murderer to get out of prison. When a man is committed to an asylum he is committed until cured, and when his sanity is proved he must be released, and, in case of murder, cannot be retried. If a man is committed to prison, there are provisions, at least in Rhode Island, by which if insane he can be transferred to the insane asylum. It is not, however, the effect in an individual case which I would oppose, but the principle of being too radical in expressing opinions as to insanity, because of the effect thus produced upon the reputation of the medical witnesses in the opinion of the court, bar and jury, and the cause of justice as a whole.

In this case time will probably show whether Palmer is an epileptic or not. The State wisely intervened and said that he must remain in the State and he is now in Butler Hospital. The records of that institution as yet show no epileptiform attacks, and I have had as a patient a man who as an attendant had the care of him for a time, and who tells me that the only thing he noticed as different from other men was a silly laugh; this laugh was used at the trial as an evidence of an unsound mind.

As a result of imperfect action of cortical areas, we can readily conceive that unrestrained reflex psychical activity may take the place of intelligent thought, that normal waking consciousness and memory may both be absent, and do we not see just this kind of automatism in somnambulism, in the delirium of fevers, in the peculiar mental state attendant on poisoning by cannabis indica, alcohol, and occasionally profound nervous shock? In this case I believe the loss of consciousness was due to alcoholism and not to epilepsy.

Clevenger[2] says: "It is a common plea of inebriates who have been arrested for all sorts of criminal acts, that they have no recollection of what they have done, and it is still more common for an inebriate to recover from a spell and to experience great mortification over what he has done, with no recollection of his disgraceful performance. The resemblance of such phenomena to epileptic phases is very close, and it is to be remembered that alcoholism may be attended with epilepsy, including petit mal and convulsions, and in the relation of cause and effect. Sometimes a hazy recollection of drunken acts is preserved afterwards, or here and there a more or less distinct memory of things spots the debauch."

Dr. C. P. Bancroft has reported four cases of "subconsciousness" where there was no reason to suspect epilepsy, and others are on record.

[2] Medical Jurisprudence of Insanity, page 614.

These facts, it seems to me, ought to caution us to be conservative in our opinions before the courts, and I believe that thereby the standing of the medical witness would be raised.

The following is a stenographer's copy of the tesitmony of the experts as given on the witness-stand:

Dr. George F. Jelly:

I have seen Amos D. Palmer at the jail and at the court. I have made six examinations of Mr. Palmer at the jail, the first time being thirteen days after the homicide, on the 25th day of February, this year. I have no doubt, upon the examination which I made at the jail, from what I have seen and heard in court of him and his testimony, from the evidence that has been given here in court, and from frequent visits to the prisoner since he has been confined in this house, I have no question that Amos D. Palmer is a man of unsound mind, that he was of unsound mind and beyond his control in mental disease at the time of the homicide; that he is wholly oblivious as to this crime by reason of his mental disease; that he is in that condition where he needs care and restraint for the treatment of his mental disease. I have no doubt also that he is absolutely honest in everything he has told you. I do not think he is capable, by reason of defective mental process, of conceiving or concocting the plan. I do not think he could combine circumstances which would enable him to make a plan of defence. I think he is telling the truth when he says it is out of his mind, and that he has no memory of the event or of his wife's features; it is absolutely true, so far as I can judge. I think he was very fond of his wife. Frequently, as a child, he has shed tears in speaking of her, and I have no doubt if to-day he could recall the crime he would not attempt to conceal it. And for that reason, I believe he should be treated as a defective, diseased man, put under care, and for himself and for the community he should be treated with the hope of doing him good and protecting him. I do not think that Mr. Palmer will ever be a strong man mentally. I do not think he has ever been. I think, under good care and treatment, he would learn better control than he has now. I do not think he will ever be a strong mind. I am afraid the disease is progressive.

Dr. Peter M. Wise:

I consider that Amos D. Palmer at the time of the homicide was unconscious of the act, that his will was impaired by reason of his mental disease, and that he was wholly irresponsible for the act. I have had well-attested facts presented to me that have not been already presented in evidence. In respect to the prisoner's mental condition, I consider the disease an incurable disease, and one very likely to progress.

Dr. Charles P. Bancroft:

I think Amos D. Palmer was not responsible for his act at the time he committed it. It is my opinion that he was in a state of unconsciousness, and that he possessed defective will power, imperfect control, and that he should be in no wise held accountable for his act at that time. I think what alcohol he took may very likely have had the effect of aggravating his already weakened mental condition, but underneath all is the fact of his imperfect mental condition, which, in my mind, dates from birth. I should say that he was a congenital imbecile. I am sorry to say that I think the disease is incurable and progressive.

Dr. George F. Keene:

In my opinion, on the 12th of February last Amos D. Palmer was irresponsible for his actions at the time by reason of mental disease. He is incurable, in my opinion; the disease is progressive.

Dr. Edward Cowles:

I have visited him five times previous to the trial, and have heard the testimony that has been given. In my opinion, he was not responsible, not in a condition of responsibility, at the time of the homicidal act. He was under the influence of a disease with which he has been affected from his birth, a defective physical and mental condition, constituting a form of disease. In addition to that, in my opinion, he has had the disease of epilepsy, which has contributed by its effects to the mental incapacity. I consider that, in consequence of that disease, there are times when under its influence he is not responsible and has not control of his conduct; that he is not responsible for what he does. I believe that the events of the night of February 12th are to him a blank, and so far as I have been able to ascertain them, and from all the evidence which we have been able to learn, that is consistent with an attack of that disease at that time, and that he was not then conscious of the nature of his act, or at all responsible for it. In my opinion, he should be placed under medical care, both for his own sake and for the protection of the public from further possible consequences of his condition; for his own sake, that he may receive the benefit of treatment it is possible that he may receive. I believe the disease is progressive and incurable.

Dr. Walter Channing:

I think at the time of the commission of the homicide that Amos D. Palmer was irresponsible. I think that from birth he has been of feeble mental organization and, as a result of a very careful physical examination that I have made of him, as well as mental examination, that he would now be classified as a high-grade imbecile. I think also that he has been an epileptic, and that, probably, on the night of the homicide he was in an epileptic condition. I think that as a result of this general condition that on the night of the homicide he was the subject of mental disease and that the act was the result of the mental disease and that he was on that night irresponsible. I think the disease will be progressive and I see no chance of cure.

Dr. Fenner H. Peckham:

I consider that at the time of the homicide, February 12, 1899, that Amos D. Palmer was in an unconscious condition as a result of mental disease, combined with an epileptic attack, and was therefore not responsible for his act which he committed. I do not think he will recover from this disease, and I think it is a progressive disease.

Dr. William H. Palmer:

My conclusions are that Amos D. Palmer, when he fired those shots that killed his wife, did not know what he was doing; he was unconscious of what he was doing; he had no control of his actions, and that all these conditions were the outcome of the disease from which he was at the time suffering and from which he has been suffer-

ing from his earliest youth. In my opinion, that disease was of the character of epilepsy, for I know of no other disease that would so arrest and retard mental development like that. I think he was therefore wholly irresponsible for his act on the night when he fired those shots. The disease will progress; perhaps in the best years of his life the advance would not be so rapid, but it will be onward, at times slow, at other times fast.

DISCUSSION.

DR. HOUGH: There is one point in the paper that I would like to bring up, and perhaps the reader can give us the information I seek. I refer to the propriety of the medical examiner acting as assistant district attorney, suggesting questions to be asked witnesses. For my part, I should like to know what the custom is in different parts of the State.

In Bristol County, the district attorney has always considered that it was one of the duties of the medical examiner to give to the district attorney every assistance possible in every way in the preparation of a case, as well as in the actual conducting of the trial, and he is expected to sit near the district attorney and suggest to him questions to be asked on the cross-examination of medical witnesses for the defence, and also questions pertaining to medical matters of his own medical witnesses. Whether this is done elsewhere or not, I should like to know, and I hope that our associate members may enlighten us.

HERBERT PARKER, ESQ.: Of course, I can only speak of my own personal experience and my own judgment in the matter, as to what may be the duty of the medical examiner, both before the inquiry in court, and during preliminary examinations. It is quite true that all district attorneys look upon medical examiners as officers to whom they can always go for assistance in investigations and preparation of a case which seems to involve medical questions in connection with a crime. My own view of the situation is this, and I have always followed it. I do not have a medical examiner with me for the purpose of prompting or suggesting questions, or appearing in any way to participate in the conducting of the trial. The medical examiner has, of course, his own duties. He makes an examination at the autopsy, and draws an inference as to the cause of death, without at the time intending to form any prejudgment as to who may or may not be connected with the death, if it should turn out to be a crime. The medical examiner, so far as possible, should stand before the court impartial because of the duty that he has taken. I agree entirely with the gentleman who has just spoken. Difficulties have grown out of expert testimony, and the reason why that testimony has been condemned in the popular mind is because the expert (which has happened in a vast majority of cases) after artful examination will stand revealed as a partisan, and the moment he has been so disclosed, I can tell you that he has become valueless. My own practice is to confer immediately with the medical examiner, after the autopsy, concerning the condition. I do not need to charge them, as they are quite as intelligent as I. They all know that if the case comes to trial their duty is to tell exactly what they saw and found, and

abstain from drawing inferences, except the inferences that are to be drawn from pathological conditions. The moment a medical examiner becomes of the belief that a person is guilty of the crime, his duty is one very dangerous to the subsequent value of the case. Of course, there is a conference with the medical examiner outside of court, and we must be diligently instructed when we try to deal with some matter within your province. Let me say here, and have it understood, that I am not at present a district attorney, but an ex-district attorney. I have always looked upon my medical examiners, in all questioning, as of the utmost value; we cannot conduct any criminal inquiries without them, but they should not participate in the prosecution. This same condition should be carried out in the trying of cases where physicians are employed by corporations in the case of an accident for the consequences of which the corporation may be held to answer. The physician goes and makes an examination, not so that he may be useful in the trial, but, as an impartial man, expresses his opinion as to the physical condition at the time of the examination, and should absolutely abstain from trying to gather from the patient when he visits him what were the circumstances of the accident, because it is always charged that the physician goes to the patient not wholly as a physician bringing the assistance of his science, but as a detective trying to make diligent inquiries to get some important statement that may be brought against that person and may be brought out in the court.

Dr. Pinkham: I should like to ask a question in regard to dying declarations. Is it necessary for a person to believe absolutely that he is going to die, before his declaration can be taken, or if he thinks that he is very likely to die, is that sufficient? That is the question. You take the criminal abortionist: there is a question about the propriety of the physician's telling the patient that she must die; he cannot be sure of it until, perhaps, she is unable then to make an intelligent statement. We save these cases up to the very last, when they seem to be in extreme conditions, but owing to surgical treatment may get well; can the physician tell such a patient that she will die and discourage her, perhaps add to the probability of her dying? If the physician must make that statement and the patient must believe absolutely that she is going to die, I think it would be difficult to get dying declarations that would be admitted to the court; it would be very rare. This is the question that I want to raise, whether in this declaration, in view of the extreme condition, probability of death would be sufficient.

Herbert Parker, Esq.: The dying declaration must be made by the deponent under the condition of mind which is removed from all hope of recovery; it must be made in anticipation of death. The theory upon which it is admitted at all as evidence, so contrary to the rules of evidence, is that the solemnity of the occasion, deepened by the belief that they are about to die and go before their Maker, and dare not die with a falsehood on their lips, has established this evidence as competent, and that the deponent at the time of making this declaration had no hope of recovery, but made it in anticipation of death. What the gentleman has said in regard to the difficulties attending

are well appreciated by courts and prosecuting officers. They know that it would be the gravest question, and that the physician would hesitate in saying something that might make the recovery of the patient doubtful. There have been quite a number of cases where I have known the attending physician to watch the patient, prepared to take the declaration when it becomes necessary, and to wait until he is sure that no human aid will save the life. Where the priest is necessary, the patient is told the condition, and so we get this condition, that many declarations used in evidence will be lost for reason of the moral responsibility of the physician. The evidence is valueless, unless given in anticipation of death, the patient having no hope of recovery.

FOOD POISONING AND METALLIC IRRITANTS.[1]

BY CHARLES HARRINGTON, M.D., BOSTON.

In the discussion which followed the reading of a report of a case of supposed ptomaine poisoning at the last previous meeting of this Society, reference was made to the great difficulty often experienced in determining the correct diagnosis, owing to the close resemblance in the symptoms produced by ptomaines and by arsenic, and in response to a question bearing on that point the statement was made that, in a doubtful case, recovery pointed to ptomaines and a fatal termination to arsenic as the cause. As this was allowed to pass without comment or contradiction, whether it was or was not intended to be taken seriously, it seems not out of place to call attention to certain points of difference which may be observed even in those cases in which the general train of symptoms points equally well either way. But first of all, with regard to the diagnostic point above mentioned it must be said that fortunately not all cases of arsenic poisoning terminate fatally, even in the absence of treatment, and unfortunately not all cases of poisoning by ptomaines recover under most careful management.

Before passing on to a consideration of the effects produced by arsenic and other metallic irritants and by food poisons, their resemblances and differences, attention must be called to certain misapprehensions concerning ptomaines and to a common laxity of the use of the term. Ptomaines are organic bases formed by bacterial action on nitrogenous organic matter of both animal and vegetable origin. They are sometimes designated as animal alkaloids, a term which in view of their possible vegetable origin is manifestly incorrect. It is a common belief that they are all poisonous in their nature, but while some of them are decidedly so, the majority of those thus far isolated are quite incapable of exerting any harmful influence. Different kinds of bacteria form different kinds of ptomaines and the same organism may produce different kinds according to the nature of the substance and according to the conditions, such as temperature, access of air and other circumstances, under which it works. In contact with certain kinds of material it may produce no ptomaines, or harmless, or very poisonous ones; and acting upon one and the same material under differing conditions it may be capable of evolving a variety of compounds equally different in action. Again, the same material may yield under like conditions poisonous or non-poisonous ptomaines, or none at all, to different varieties of bacteria.

We have fallen into a common habit of ascribing to ptomaines the effects of all forms of organic poisons due to decomposition of food materials, regard-

[1] Read before the Massachusetts Medico-Legal Society, October 4, 1899.

less of the fact that other substances than organic bases are formed by bacterial activity. To these substances various names have been given, and at the present time there is considerable difference of opinion as to their applicability. In view of the fact that this confusion exists, and that in any case of poisoning of this sort the nature of the toxic substance cannot be known until it has been demonstrated by careful analysis, I would suggest that it would be preferable to adopt a general term suggesting food poison rather than a specific one having reference to the particular kind of product, the presence of which is suspected but not demonstrated.

In all cases of food poisoning the effects produced are due either to substances formed by bacterial agency in the food itself before ingestion, or to toxic substances developed within the body after infection by the contaminating bacteria. They vary widely in character, sometimes closely resembling those caused by metallic irritants, sometimes suggesting the presence of narcotics, and again being mistaken for infectious disease of common occurrence. For the purpose of this paper only those cases in which the symptoms resemble those of poisoning by metallic irritants will be considered. The individual members of the latter class cause practically the same group of symptoms, but with the exception of arsenic they cause such peculiar metallic tastes that their effects are not very likely to be mistaken for those of bacterial products. Therefore, the discussion may most properly be further limited to the resemblances and differences observable in poisoning by this substance and by foods.

From the character of the onset, no assistance in making a diagnosis can be expected, because of its exceeding variability in both classes of cases. In arsenic poisoning the first effects may be manifested almost immediately or not for a number of days, even after as many as eight or nine. In one recorded case the first effects were shown eight days after ingestion, and recovery was complete within a short time; in another no symptoms appeared until the ninth, and death occurred on the twelfth. The symptoms generally begin with burning pain in the stomach, vomiting, diarrhea and other evidences of gastro-intestinal irritation, but they may, on the other hand, resemble those of narcotic poisoning up to within a short time before death, when those of irritation may appear. Again, no effects whatever may appear for some hours, and then death may follow very quickly after. Thus, in a case in which nothing remarkable occurred until seven hours after the poison was taken and no signs of irritation until the following day, the latter appeared suddenly, and within a half-hour the victim was dead. The onset in food poisoning may appear almost at once or at any time up to four or five days, and the same food shared by a number of people may affect them at widely different times and with different degrees of severity according to the amount eaten. Sometimes, too, different portions of a piece of meat or of a sausage or other food are unequally altered by putrefactive changes or unequally cooked, and thus produce different manifestations. As is the case with arsenic, fatal termination may occur in much less than twenty-four hours or may be postponed many

days. In both classes the vomitus is very variable in character and appearance. It is less likely to be bloody in food poisoning, but may on the other hand be quite devoid of any remarkable appearances in poisoning by arsenic. The stools, too, present no uniformity of character in either case, but they are likely to be bloody in arsenic poisoning and to be extremely and unusually offensive in food poisoning. Diarrhea may be present in neither, but instead there may be obstinate constipation.

In arsenic poisoning constriction and heat in the throat, cramps in the calves and elsewhere, coldness of the extremities and of the whole surface of the body, weak, almost imperceptible, pulse, anxious countenance, eruptions of different kinds on the skin, great prostration, headache, stupor and convulsions, are common symptoms, and in food poisoning they are equally so. In short, most of the symptoms caused by the one are commonly observed in the other.

There are, however, three notable differences:

In arsenic poisoning we observe heat and constriction in the throat; the patient often finds it difficult to swallow because of the pain which accompanies the effort. In food poisoning these same effects are among the most constant symptoms, and in addition, swallowing and speaking may be even impossible rather than simply difficult. This is *not due to pain*, as in arsenic poisoning, but to involvement of the nerve cells; there is a genuine condition of *paralysis* of the throat, such as is not seen in poisoning by any of the metallic irritants. Sometimes this difficulty is one of the very first symptoms.

A second point of difference is the condition of the pupil. In most of the reported cases of food poisoning of the class which we are considering a marked dilatation of the pupil has been noticed, and in many, also, great impairment of vision and even total blindness. In some cases the eyes react not at all to light. Rarely, instead of dilatation, contraction of the pupils is noticed, and sometimes the one condition succeeds the other.

A third point of difference is the extent to which the muscular system is involved. In arsenic poisoning there is great prostration, but as a rule the patient is able to stand and walk about, though only with great effort. In food poisoning, on the other hand, it is most commonly the case that the legs refuse to support the body, even when the patient is assisted. In one outbreak, in which over 70 persons were involved, this condition was remarked in almost every case; in another, in which the number of victims was 30, the same condition was noticed in all.

Fortunately, in the matter of treatment, the diagnosis between arsenic and food poisons is not of very great importance. In either case the removal of the offending substances from the alimentary tract by appropriate means and supportive treatment are essential. In doubtful cases the administration of the usual antidote for arsenic can do no harm even though that poison is not present.

In cases of fatal ending the post-mortem appearances are by no means always to be depended upon to clear up doubtful diagnosis. In some cases of

fatal arsenic poisoning the lesions are no more extensive than those of food poisoning, although as a rule the latter are slight or wanting.

DISCUSSION.

DR. HOUGH: I think that the question here is a question of diagnosis during life, as well as the appearances after death. I fear that I have not grasped some of the points in Dr. Harrington's paper, wherein he makes out in three points for diagnosis the difference between arsenical and ptomaine poisoning. In the first place, in food poisoning the actual paralysis of the throat, so that swallowing was impossible, and the patient could not speak; second, in food poisoning there was usually dilatation of the pupil, sometimes absent, and rarely detected; third, you could make a person poisoned by arsenic get up and walk, but in food poisoning you could not. As physicians, we could hardly make use of the last-mentioned sign or diagnosis, so it appears that we are limited to the dilatation of the pupil, and the paralysis of the throat. We must acknowledge that in some cases, if not many, that diagnosis during life is impossible, and we have only the chemical examination.

PROFESSOR HARRINGTON: I did not mean to imply that there are no cases which it is absolutely impossible to diagnose without these signs; I have, however, taken some which are very common in food poisoning, and not observed in arsenic poisoning. I certainly should not advocate taking a man out of bed to make him walk; the man absolutely cannot walk in food poisoning, but simply slumps to the ground. As to dilatation, that is another point which is not invariably present, not very commonly. I do not think that it is commonly present in poisoning by arsenic. While there is likely to be great difficulty in swallowing before death, caused by arsenic poisoning, that difficulty is owing to emotion of pain, while in food poisoning there is an involvement of the nerves of the throat, and swallowing is impossible, not on account of pain, but the inability to swallow. There are one or two other points that I have mentioned on which I have laid no special emphasis, as to the character of the stool, very offensive odor in food poisoning, which in arsenical poisoning is not so. There are a great many cases recorded where, from the symptoms as given, it is impossible to determine whether food poisoning or arsenic poisoning was the cause of death. Oftentimes where arsenical poisoning has been suspected, a chemical analysis made afterward found no arsenic, but ptomaine poisoning had been demonstrated.

DR. HARTWELL: I was particularly interested with what Professor Harrington said in reference to paralysis of the throat as a point in food poisoning. At a hotel in London, some 70 people were prostrated, and one, Professor Webber, died within forty-eight hours. In all of the cases the papers stated that the prostration was caused from ptomaine poisoning, and many would not be able to live, and our English cousins claimed the sickness was caused by certain products that came over from America, as those prostrated had eaten something that had come in cans, apricots or peaches. The case comes up in October, and there is wide attention given it in the city of London, on account of the standing of the hotel.

A CASE OF EXTRA-UTERINE PREGNANCY.[1]

BY FRANK HOLYOKE, M.D., HOLYOKE, MASS.

On December 5th, at 2 A. M., I was summoned from police headquarters to view the dead body of a woman who, though unmarried, called herself Mrs. Eugene S., of Boston. She had been visiting a friend in Holyoke for the previous three days. Her history and habits for the past sixteen years had not been a credit to her sex. The friend whom she was visiting stated that the deceased had visited her on the 6th of last July and again on the 15th of September, on each occasion complaining of considerable abdominal pain. On this her last visit, she reached her friend's house December 1st, at 11.20 P. M. On the second day she went out in the morning and did not return until evening; on the third she lay down most of the day, and on the fourth she went out after dinner and came back at 4 P. M., complaining of terribly severe pain in the belly. At 8 o'clock she began to grow weak, very restless and pale, calling for water continually. She was conscious until near the end; refusing to see the priest or physician. She died at 1.15 A. M., three-quarters of an hour before I viewed the body. The body was still warm. There was at this time no rigor mortis.

On making a vaginal examination I was unable to reach the os, but through the anterior vaginal wall, which protruded forcibly into the vagina, I could very readily feel ballottement of a floating body of a size which would indicate that she was at least five months pregnant. The posterior cul-de-sac bulged prominently as though filled with fluid. There was no trace of blood in the vagina nor history of hemorrhage. Through the very thick abdominal wall a tumor could be felt rising from the pelvic cavity as high as the umbilicus.

The body was removed to an undertaker's wareroom, where, nine hours and a quarter after death, the autopsy was made. The body was that of a woman thirty-six years of age, weighing about one hundred and sixty pounds; the skin surface was pale; there was marked absence of livid spots; the belly was much distended. The abdominal walls were very fatty. Large, black, tarry clots covered the omentum, and the abdominal cavity was filled with clots and serum. Beneath the omentum there was found what looked, at first sight, like a large, ruptured ovarian cyst with a very vascular wall, to which the omentum and intestines were extensively and firmly adherent. This cyst lay between the folds of the right broad ligament. It reached as high as the umbilicus. The cyst wall was ruptured in the upper anterior part.

[1] Read before the Massachusetts Medico-Legal Society, February 7, 1900.

The uterus was pressed high up out of the pelvic cavity to the left, which accounts for my inability to find the os by vaginal examination before the autopsy. This abnormal position of the uterus was produced by the combined pressure of extravasated blood in the posterior cul-de-sac and the forcible bulging of the tumor anteriorly. I doubt if the uterus was so hard to reach prior to the rupture. The uterus was six inches long, the cervix softened and filled with mucus. The body of the uterus was soft and thickened proportionately to its size, though the enlargement was more in the long axis. The lining of the uterus was softened and very pale.

The tumor was ruptured at the site of the placenta. In breaking up adhesions the sac wall tore readily, showing, beneath, the amnion, unbroken and adherent throughout to its covering, which was composed of the anterior and posterior layers of the broad ligament; the pregnancy being tubal in origin, and primary rupture having occurred in the early months. The amnion contained a six months fetus, lying transversely with its breech toward the right ilium.

I could find no hematoma or other evidence of earlier hemorrhage, though such probably took place to some degree at the time of the primary rupture of the tube into the broad ligament; in such a case the hemorrhage is usually less than when it occurs in the abdominal cavity, and the fetus is more likely to live and to continue developing until destroyed by secondary hemorrhage into the placenta, or into the general peritoneal cavity by a secondary rupture of the sac.

The pelvis of the right kidney was very much distended, as was also the ureter, and this was caused by pressure of the tumor and its firm adhesions. The lungs were perfectly healthy. The gall-bladder contained one calculus. All other organs of the body showed a tendency to fatty degeneration.

She had been treated last September for what was pronounced as rheumatism in the right buttock and thigh, which, however, was probably a mistaken diagnosis, as her regular physician tells me that she had never suffered with rheumatism before. But many of these cases of extra-uterine pregnancy complain of intense pain following along the course of the sacralplexus distribution.

With apology, I add to my report of this case a few notes from some of the latest literature on the subject, which, being of interest to me, will, I hope, not weary my listeners; for, with the exception of appendicitis, nothing seems to have interested the surgeon and gynecologist more than this subject during the past few years; and while they are discussing the treatment and proper time for operation it behooves us to consider the subject from its medico-legal side, if in a hasty review of a few of the peculiar anomalies which interest us, we can find some facts or theories to work from which may increase the importance of this subject in forensic medicine.

Most writers believe that it has been proved that the normal place of impregnation is in the tube. How much, then, may we be helped by a review of the supposed causes of the occurrence of tubal pregnancy? Some authors

think that the larger percentage of these cases occurs among the lower classes, attributed chiefly to their malnutrition; while others believe that the hard work or straining at heavy lifting is a chief cause of arresting the ovum in the Fallopian tube. But we read that other possible causes are fright or shock; and that catarrhal or other inflammatory diseases of the tube, or any diminution of its lining epithelium, or any mechanical obstruction in the nature of new growths within the tube, or pressure from abdominal or pelvic tumors, have also been demonstrated as causes of the arrest of the ovum in the tube.

Dr. T. A. Stoddard,[2] however, presents the history of a few cases to illustrate what he considers a plausible theory, that the large majority of cases of tubal pregnancy, if not all, are impregnated just prior to a menstrual period.

It has been considered that, as a rule, tubal pregnancy follows a sterility of some years, but to this rule there are many exceptions. It occurs both in multiparæ and in those who have never given birth, and with many complications.

We find, for example, cases of tubal pregnancy occurring two or three times in the same individual. Tubal twin gestation has also been reported. A number of cases have been collected of ovarian or tubal pregnancy together with normal uterine pregnancy; "the mother, in one case, being delivered at full term of two healthy, well-developed children."[3]

In fact, extra-uterine fetation carried to maturity is not exceptional, and laparotomies performed near the end of gestation with living extra-uterine child are no longer rare, but "the fruit is not only short-lived but deficient in development,[4] both physical and mental."

I would say that if our old and beloved instructor in anatomy were among us, Dr. Oliver Wendell Holmes, he might explain a reason for this deficient development of these record-breakers of our genealogical tree, for I well remember in one of his lectures, in referring to the calibre of the Fallopian tube, he straightened himself up to his full height, which was indeed majestic, when he spoke with emphasis, and looking very seriously at the class said: "Just here, gentlemen, I want you to understand that not one of you is any better than I am, for we have all passed through the sixteenth of an inch."

The diagnosis is often very difficult, but has been made before operation as early as the second week, although for a diagnosis to be made before the fourth or fifth week is very unusual, even for the most expert gynecologist. Primary rupture occurs more often within the first three months, most frequently in the second and third. However, it may take place in any month.

Cessation of menstruation is not always a symptom of extra-uterine pregnancy; but the menstrual irregularities may induce us to suspect the possibility of its existence. In case of rupture and the throwing off of the decidua

[2] American Gynecological and Obstetrical Journal, January, 1897.
[3] H. Ludwig: Wien. klin. Wochensch., July 2, 1896.
[4] L. E. Frankenthal: American Gynecological and Obstetrical Journal, September, 1896.

from the uterus, we have symptoms which closely resemble a miscarriage. It is advisable that the physician examine the patient with the possibility of finding a tubal pregnancy. In a case of hematocele this also becomes our duty. Hemorrhage may occur by rupture of distended vessels upon the surface of the sac.

This completes the few points which occur to me as of special interest to the medical examiner in connection with a report of the specimen. But I ask myself of what immediate value, medico-legally, is the autopsy of a case where the history and view, together with external and vaginal examination, all point to rupture of an ectopic sac, unless we may thereby help to solve some question connected with the administration of justice? May we not expect to discover approximately at what time she conceived? Can we not help to prove or disprove an attempted abortion? Or may we not be the means of freeing a fellow-practitioner from suspicion of malpractice, as did Dr. Flavian Krug in an interesting case where the physician in charge was believed to have given poison by mistake; the death of the patient from rupture of the sac unfortunately following his hypodermic almost instantly?

Such and possibly other questions may arise in a given case. But the most valuable notes on this specimen you will now have the pleasure of listening to from Dr. F. W. Whitney, who has carefully examined and prepared it for the Warren Museum, as a peculiarly interesting addition to the study of this subject.

ANATOMICAL REPORT BY DR. W. F. WHITNEY.

The specimen consists of the uterus and adnexa. The uterus is enlarged, the extreme length 14 centimetres. The wall is thickened, the cervical portion measures one centimetre, the fundus measures three and a half centimetres, and the breadth of the fundus is eight centimetres. The interior of the uterus is lined with a soft, slightly shaggy and irregular membrane varying in thickness from two to four millimetres and was somewhat folded. The cervix is dilated and filled with tough mucus, the glands about the orifice being large and distended with the same material.

On the left side the ovary and tube are normal. On the right side the tube is normal for a distance of a few centimetres and then is lost on the surface of a sac 21½ centimetres in diameter.

There are no adhesions between the uterus and the tumor, which is cystic in character and lies between the folds of the broad ligament. On the upper part the covering is more or less torn and reveals a shaggy mass which is divided into two parts — one measuring about seven centimetres, in which is a considerable hemorrhage; and the other about five centimetres in diameter, which is pale and bloodless. This shaggy coat is partly lifted up and reveals a fetus of apparently about the sixth month, lying in an unruptured amniotic sac. The fluid surrounding the fetus is of a dark bluish-red color. No ovary could be detected on this side.

The diagnosis is a retroperitoneal pregnancy originating in the tube, and apparently about the sixth month. A decidua was present in the uterus.

THE MARKS PRODUCED BY PISTOL SHOTS.[1]

BY G. DE N. HOUGH, M.D., NEW BEDFORD, MASS.

THE object of this research was to ascertain what inferences could be drawn as to calibre of weapon and distance from which it had been fired from the marks produced on the skin or clothing.

The material used was as follows: One .22-calibre revolver of unknown make capable of using either long or short cartridges. With this I used Winchester Co.'s .22 short cartridge containing 3 grains of powder and 30 grains of bullet; the same make smokeless cartridge containing 1½ grains powder and 30 grains bullet; the Union Metallic Cartridge Co's. .22 short and .22 long cartridge whose exact contents of powder and bullet I was unable to learn. All .22 cartridges are rim fire, and it is not probable that the Union Co's. differs much in charge from the Winchester's. Judging from the mark, however, the former uses a coarser grained powder. In .32 calibre I had several pistols: (1) A Young America, double action, centre fire, with a 2-inch barrel firing a short .32 U. M. C. Co.'s cartridge with 10 grains of powder and 88 grains of bullet; (2) Hopkins & Allen's Mfg. Co.'s Dictator, single action, rim fire, 3-inch barrel, with a Winchester .32 short cartridge, containing 9 grains of powder and 82 grains of bullet; (3) Hopkins & Allen Co.'s X. L., double action, rim fire, 3-inch barrel, with Winchester .32 short, containing 9 grains of powder and 82 grains of bullet, and U. M. C. Co.'s .32 long, containing probably 13 grains of powder and 90 grains of bullet (this is what their long centre fire, .32 and W. Co.'s long rim fire .32 contain); (4) Iver-Johnson Arms & Cycle Works, double action, tip up, automatic ejector, centre fire, 3-inch barrel, with U. M. C. Co 's .32 short, containing 10 grains of powder and 88 grains of bullet, and also with the U. M. C. Co.'s .32 short smokeless, containing about 4 grains of powder and 90 grains of bullet. In .38 calibre I had: (1) American Bull-dog, double action centre fire, 2½-inch barrel with U. M. C. Co 's short .38, containing 15 grains powder and 146 grains bullet; (2) a Belgian imitation of Smith and Wesson's Automatic Ejector, double action, 3⅝-inch barrel, with same cartridge as in previous pistol, also with the .38 central fire S. & W. cartridge of the United States Co., of Lowell; (3) a Colt's single action, 7½-inch barrel with U. M. C. Co.'s .38 long Colt's, centre fire cartridge, containing 18 grains of powder and 150 of bullet. I had finally an old-fashioned Derringer of .41 calibre and 2⅜-inch barrel requiring a .41 short, rim fire cartridge. I had great difficulty in obtaining ammunition for this pistol, and that which I did get was without label on the box, so I cannot tell by whom it was made. The W.

[1] Read before the Massachusetts Medico-Legal Society, February 7, 1900.

Co.'s cartridge of this size contains 13 grains powder and 130 of bullet. It is probable that the cartridges I obtained contain about the same charge. I regret very much that I was unable to procure any pistols of larger calibre and that my outfit was so limited, and I wish to point out here, once for all, that my conclusions are based on experiments with the above-mentioned weapons and ammunition, and refer only to the marks produced by them. Whether any modification of my conclusions will be rendered necessary by experiments with other calibres and ammunition, I of course cannot say.

Method of experimentation. — I had an apparatus constructed which would enable me to measure the distance of the muzzle of the pistol from the target within one-eighth of an inch and at the same time hold the pistol securely while not preventing the recoil or the upward jump of the muzzle at the instant of firing. As targets, I used a variety of things — various sorts of leather, cloth and paper. Whatever material I used, the character of the mark was the same. I used white blotting paper most extensively because the mark could more easily be seen, and because it was my opinion that powder grains would embed themselves in it about as easily as in the human skin. Now while the character of the mark is the same, its appearance varies much with the different materials, so that, given a powder mark on a piece of clothing, I should consider it extremely advisable to confirm one's opinion as to the weapon and the range by actual experiment with similar pieces of cloth.

Results. — The same pistol at the same range with similar ammunition produces the same mark. The mark consists of (1) the bullet hole; (2) the burn; (3) the smut; (4) the tattoo. Beyond a certain distance, a pistol mark consists only of the bullet hole. This distance depends upon the calibre of the weapon and the size of the powder charge. Thus for a .38 long Colt, central fire, which is loaded with 18 grains of powder and 150 grains of lead, fired from a Colt's revolver of 7½-inch length of barrel, I could get no mark except the bullet hole at a distance of anything over 11 feet. As we approach the target, the tattoo begins to develop. This consists of unburned powder grains and droplets of the grease with which the bullet is lubricated. With the pistol and ammunition above mentioned the tattoo is well defined at a range of 7 feet, but the individual grains are widely scattered. Further diminution of the range results in a condensation of the tattoo, the individual grains getting closer together, the whole mark covering a smaller area, and there being a larger and larger number of the grains close to the bullet hole. It occurred to me to count the grains in the marks by means of the device which I now show you. In general it is undoubtedly true that there are more grains between the centre and the 1-inch circle than between the 1-inch circle and 2-inch circle, and more between the 1-inch and 2-inch than between the 2-inch and 3-inch, and so forth. The progressive condensation at progressively shorter ranges is still more strongly brought out by counting the number of grains in equal areas, situated half an inch, an inch, etc., from the centre.

I hoped that the numbers found might enable one to determine definitely the distance at which the shot had been fired, but the variation in size of the grains is too great and there are other difficulties which seem to me insurmountable at present. Arriving at a certain distance, which with the pistol and ammunition above mentioned is 15 to 18 inches, the aggregation of powder grains immediately about the bullet hole has become so dense that the mark has a distinct black spot at its centre which I call the *smut*. At the same time the burn becomes visible. Continuing to diminish the range the smut and burn become larger and larger and the visible tattoo smaller and smaller, until finally there is nothing but the smut and burn to be seen. At the same time the form of the mark becomes more and more perfectly circular, until with the muzzle of the weapon in actual contact with the target we have nothing but a round black mark.

As long as we use ordinary powder, this is the series of changes which the mark undergoes, no matter what the weapon or ammunition may be. The variable parts of the mark (smut, burn and tattoo) are produced by that portion of the powder charge which is not completely burned and one would naturally expect that with any one pistol the size of the mark would depend upon the quantity of powder in the charge and that the distance at which a certain kind of mark is produced would depend upon the same element. This is not true, however, as is shown by a comparison of the series of marks produced by short and long .22 or .32 cartridges; at any rate when the difference between the charges is as little as in these instances no difference in the mark is manifest.

In the case of the long and short .22, there is a difference of 40 per cent. in the respective charges of powder and in the case of the .32 the difference is 44 per cent.

The difference in the mark produced by pistols of different calibre is very noticeable, the size of the mark increasing with increase of calibre and the range at which the different elements of the mark are developed differing considerably. With pistols of the same calibre but different length of barrel different marks are produced at the same distances but the differences are by no means as great as one would suppose, as may be seen by a comparison of the marks produced by the .38 Colt with 7½-inch barrel with those of a .38 American Bull-dog with 2½-inch barrel.

There are about 12 different calibres in use, varying from .22 up to .50. Some of these, namely, .22, .32 and .38 can be obtained in almost any city or town, the others, except by accident, only in large cities unless they are specially ordered. The possibility, however, of one of these unusual calibres being used in any case can never be excluded and neither can we say beforehand that an assailant may not have somehow come into possession of one of the many forms of obsolete muzzle-loading pistols, though the latter can hardly be found, that is, if you want one, except in a museum.

I regret to say that it is not possible to determine with absolute accuracy, from the mark alone, what was the calibre of the weapon used or the dis-

tance from which it was fired. Still these points can be determined within certain limits, the calibre from the size of the mark and the distance from its character. In my experiments, if the mark is wholly a smut, with no tattoo zone, the shot was fired at a distance of not over 6 inches. If the mark consists of a tattoo with a distinct smut at the centre, then the distance at which the shot was fired was not over 2 feet. If the mark consists of the bullet hole alone, then the range was not less than 4 to 6 feet if a .22 calibre was used, 7 to 9 feet if a .32, and 9 to 12 feet if a .38 or 41.

For practical purposes one must have a library of experimentally produced marks as standards, and by comparison of the mark actually found with these standards, helped in some cases by a little additional experimenting, a sufficiently close approximation to the calibre and range of the weapon used can ordinarily be made.

DISCUSSION.

Dr. Draper said that he deemed it very important in making experimental shots in preparation for a homicide trial that the same weapon should be used as was used in the homicide, and that ammunition of identical kind and calibre with those which the accused had employed should be taken. In cases where a defendant's liberty or life is at issue, the expert should avoid guessing as well as dogmatism in his opinions and the nearer a medical witness can come in his experiments to the same conditions as those of the crime the more trustworthy his conclusions will be. Observations like those reported by the reader have a distinct value, but they suffer an obvious loss in trustworthiness as data because an attempt is made to establish a standard by means of shots from revolvers chosen for the purpose without reference to those used in the crime itself. Better evidence would seem to be afforded by photographs of the bullet wound found upon the victim of the crime; such photographic representations tell their own story much more graphically than could be accomplished in any other way.

Dr. Hough: I want to state that the object of my investigation was to discover what, if anything, we could tell from the mark; if we have the weapon that was used, it simplifies the problem very much indeed. I think that if we have the weapon and know the ammunition that was used, we can say that the problem is practically no problem; and I stated in my paper that marks produced on different sorts of material are different in appearance, although the same in character, and I further stated that it was extremely advisable in experiments in any given case that the same material be used on which the mark has been made. I quite agree with Dr. Draper in what he says. I simply wish to call attention to the fact that I was aware of these objections he makes, and I thought that I brought that out strong in my paper, though not strong enough apparently. I would not for a moment go into court and testify as to the calibre and distance at which a weapon was fired, with nothing to guide me except these things, unless I made considerable reservation. But you can see from these papers how the difference in the mark is produced at a small difference in range, and I think that it is

important, and that it shows us that we can tell very closely, if we take sufficient pains, the calibre and distance from which a weapon was fired by the mark found.

DR. MEAD: I think that the legal profession are fully aware of the importance of having the same powder and the same material in experimenting. In a case in which I was interested, the man being killed, Attorney-General Knowlton insisted that the experiments with the revolver be made on a leather jacket, same as the one worn by the dead man; not the same jacket, but another one similar, and they took this pains to get it. The police failed to get this leather jacket at one of the city stables, where it was thought that the men all wore leather jackets, for it was found that they were all using canvas. A man was then posted on the old Mill Dam Road, and stopped somewhere from twenty to thirty milkmen, until he found two leather jackets that were like the one the deceased had worn when he was shot, and he spent all night getting that jacket to bring it out to Watertown to me to make experiments in the morning. And that taught me a lesson of the importance of getting the same material, if these experiments are made; and I think it is one of the lessons to carry away from the reading — to experiment with the same powder and same weapon, and to make the experiment as near as possible on the same material as that of the homicidal act.

MR. SUGHRUE: This has all been very interesting to me. It seems to me that the prosecuting officer could, and would, receive very great assistance from such experiments as have been made here. The difficulty that has been suggested in reference to experiments upon the same coat or upon the same substance is ordinarily one that is not of great importance, because it is not competent to introduce evidence of experiments. The court will not permit you to make experiments in court, and the only use of such experiment as this is as illustrations. The expert comes in and states his opinion, and the importance of his opinion depends upon that upon which it is based, and the danger of such testimony is that if it is not accurate, if the expert can be attacked, if there is a wide range between the experiments, and if it is shown that it is not exact and that his testimony is based upon a foundation that is not very secure, it is very bad. But I can conceive that such experiments as have been made here would be of very great value in a trial for homicide by shooting or intent to murder; if it can be said, within given limits, that certain things mean certain other things, it is going to be of very great importance, and I can conceive that this would result from such experiments as Dr. Hough has made, and would be of very great importance in the trial of cases.

DR. PERKINS: In the case that I reported at the last meeting something came up in regard to the mark made by the shot which did not play any important part, but was of some interest. The woman shot at had on a blanket wrapper, and as I was not certain in regard to the distance at which the weapon was held, I made experiments. I obtained material the same as that worn in the blanket wrapper, by going to several of the wholesale houses;

I also used the same revolver, although I could not get the same ammunition, and I found by the burns that the revolver had to be within twelve inches of the burned blanket wrapper. But another thing in regard to these burns which I found out was the care which should be taken in preserving the material burned. In that case I transferred the garment to the police, and as it was some distance to the station, the man took it to his home; when he got it again, he found that the servants had carefully washed it, and as a result the evidence of the burn had been destroyed. As this was an insanity case, it made no difference, but in another case it might be of great importance.

DR. HOUGH: I want to speak of a case where this was of some importance. The weapon and ammunition were unknown, and from the mark, I told the officers that it had probably been made with a .32-calibre, and the distance, as I figured it, had probably been not more than two inches. The man pleaded guilty when the case came into court. But the officers found the pistol which he might have used, and the ammunition which he might have used, and which they believed he did use, and it was found they corresponded with my suggestion.

Another point which I did not mention, because it did not amount to anything, was, I was in hopes that marks in cloth, for instance, that of a black coat, might be brought out by the x-ray photograph, but the cross light coming through carbon prevented satsfactory results.

THE LAW OF DYING DECLARATIONS.[1]

BY M. J. SUGHRUE, ESQ., BOSTON.

THE rules of evidence relating to the competency of statements of dying persons are a branch of the law with which physicians are frequently called upon to deal. A brief recital of some phases of this branch of the law, the scope of which has recently been extended by statutory enactment, is here attempted.

It is a general rule of law that statements made by third persons are not admissible in evidence, but are within the class of hearsay evidence, and are usually excluded. To the rule excluding hearsay evidence there are some exceptions; among them are dying declarations. Dying declarations are statements of material facts concerning the cause and circumstances of a homicide made by the victim, under the solemn conviction of impending death.

There are certain other declarations of dying persons which may not be admissible under the dying declaration rule, but which may be competent as part of the *res gestæ* (which are the circumstances of the transaction) on the ground of their natural, contemporaneous and explanatory connection with the main transaction. To be admissible under the latter rule, the declarations must be so nearly contemporaneous with the main fact as to be part of the *res gestæ*, but need not have been made under a conviction of impending death. On the other hand, to be admissible under the dying declaration rule, the declaration need not be part of the *res gestæ*, but must have been made in the consciousness and expectation of immediately approaching death.

Certain declarations made in the presence of the defendant are also competent for the purpose of showing defendant's response, when charged with causing the injury done to the deceased; the admissibility of this class of evidence depends upon the conduct, presence and response of the defendant. It is not necessary to the admissibility of dying declarations that the defendant should be present when they are made. Confessions, admissions and declarations are words frequently used interchangeably, but are each technical terms of distinct significance. A confession is a statement by a person of his agency or participation in a crime. An admission is an acknowledgment by a party to a suit of the truth of some incidental fact or facts. Confessions and admissions are made by parties to the indictment or suit; declarations are made by third parties.

[1] Read before the Massachusetts Medico-Legal Society, February 7, 1900.

An examination of the law of personal statements generally would involve a broad inquiry of no special interest from a medico-legal standpoint and will not here be attempted; but that branch of this law which relates to dying declarations is alone considered.

A fuller statement of the rule relating to dying declarations than the one hereinbefore given is this: Where a defendant is on trial for homicide, the declaration of the person whom he is charged with having killed, if made while *in extremis* and under the solemnity of a conviction that he was at the point of death, and relating to matters of fact concerning the homicide which passed under his own observation, may be given in evidence.

The reason for the rule excepting dying declarations from the rule against hearsay evidence is that the solemnity of the circumstances under which such declarations are made naturally constitutes a guarantee of their truth equal to that which is afforded by the customary oath.

The further reason for the rule is in the necessity of the case; the victim of the homicide having passed away, and as there may be no other witness to the transaction, in order that the malefactor may not go unpunished, the strongest reasons of public policy require the admission of this testimony.[2] It was objected that the admission of this testimony contravened the constitutional provision that the accused should be confronted by his witnesses face to face, but Chief Justice Shaw declared that dying declarations are admissible notwithstanding the Twelfth Article of the Declaration of Rights, that every subject shall have the right to meet the witnesses against him face to face, and this rule has been affirmed so often that the question is no longer open.[3]

In order that a dying declaration may be given in evidence the following conditions must be shown: That the declarant must have been conscious of impending death; that death must have occurred; that the statement must relate to the crime and be a description of the crime itself, and its manner of commission and of the person who committed it.

Even if the death was impending, if the declarant did not so believe, the declaration would not be competent; all hope of recovery must have been abandoned, and the declarant must be without hope or expectation of recovery.[4]

It is not necessary that declarant should be actually breathing his last; even though he lived some time, the declaration is competent if made under a sense of impending death.

It has been held that statements made by the deceased while he yet entertained hopes of recovery are admissible if they were reaffirmed by him after he lost all hope.

FORM AND MANNER OF GIVING DECLARATIONS.

The form of the declaration is immaterial; it may be made orally or in writing. It is not necessary that a declaration should be expressed in words;

[2] Commonwealth v. Casey, 11 Cushing, 421.
[3] Commonwealth v. Casey, 12 Cushing, 246.
[4] Commonwealth v. Bishop, 165 Mass., 148.

it may be communicated by signs. It was said by Chief Justice Shaw, in Commonwealth v. Casey cited above, that "If the injured party had but the action of a single finger, and with that finger pointed to the words 'yes' and 'no,' in answer to questions, in such a manner as to render it probable that she understood, and was at the same time conscious that she could not recover, then it is admissible evidence."

It will be sufficient if the declaration is taken down in writing by a bystander, and the writing then read over to the deceased, who assents to its terms and affixes his signature. But it is not essential that it be taken down in writing or that it be signed, but it will be useful so to do to preserve the evidence.

If the statement is carefully drawn and is a fair recital of the declarant's statement, it is not fatal to its competency if the exact words of the account of the case are not used. The declaration is admissible even if brought out by means of questions. It is not necessary that the declarant should be sworn. Dying declarations are admissible in favor of the accused as well as in favor of the Commonwealth.[5] But in each case the declarant must be the person who was the victim of the homicide.

CASES IN WHICH DYING DECLARATIONS ARE ADMISSIBLE.

They are admissible only in cases of homicide, and in such additional cases as have been provided for by statute.[6] By statute, abortion cases have been included.[7] Dying declarations are admissible only where the death of the declarant is the subject of the inquiry; they are not admissible to prove any other death. On an indictment for murder it is not competent to introduce the statements of another person that he killed the deceased.[8] Defendant in a case tried in New York offered to introduce a letter which might be regarded as containing a confession of another person that he had committed the murder; the evidence was excluded.[9]

Where three persons are jointly indicted for murder, and one of them is tried separately, it is not competent for him to give in evidence a conversation between the other two when they were alone, inculpating themselves, and exculpating him from all participation in the crime.[10]

On an indictment for an assault with intent to murder, it was held that although the accused might exculpate himself by showing that another was guilty, yet this rule goes no farther in favor of the accused than to allow him to show another's guilt by some appropriate evidence directly connecting that person with the *corpus delicti*. Therefore mere disconnected threats and declarations of third persons are inadmissible.[11]

Where the defence of a criminal charge is that a third person committed

[5] Commonwealth v. Bishop, 165 Mass., 148.
[6] Commonwealth v. Thompson, 159 Mass., 56.
[7] Statute of 1889, chapter 100, Laws of Massachusetts.
[8] Wharton on Homicide, Section 603.
[9] Greenfield v. People, 85 New York, 75.
[10] United States v. Douglas et al., 2 Blatchford, 207.
[11] State v. Baudet, 53 Ct., 536; West v. State, 76 Ala.

the offence, the confession of such third person, made after the offence and not part of the *res gestæ*, is not admissible in evidence.[12]

The testimony of the declarant may be discredited as that of a witness taking the witness stand and testifying. It may be shown that the declarant was not mentally capable of making a statement, that his reputation for truth was bad. The statement of the dying person must be of matter competent; it must not be merely an expression of opinion, it must be a statement of facts which could be testified to if the declarant lived and was a witness at the trial.

It is competent for the defendant to introduce testimony to show that the deceased has made contradictory statments, and it is competent for the government to introduce testimony corroborative of the dying declaration.

In passing upon the weight to be given to dying declarations the jury have a right to consider all the circumstances under which it was made, and all the conditions by which the dying person was surrounded, and the state of mind of declarant, as shown by all that was said and done. Conduct, deportment, condition, all should be noted by the person who is to be a witness. Declarant's conduct in saying farewell to his relatives, in making such provision as is made by persons about to die; if the declarant is a Catholic, if he receives extreme unction, this is of importance as indicating the state of mind. It will be found a most useful practical rule in these cases first to ascertain the state of mind of the dying person, and after that an expression by him that he has no hope of recovery, then to listen to a recital of the story of the crime.

It is because of a failure to proceed in this way that physicians frequently obtain an account of a crime which cannot be used in evidence, and it is more often because of inadvertence than want of knowledge; but the result is equally disastrous so far as a successful prosecution is concerned. Particularly is this true in abortion cases, in many of which, apart from the evidence obtained at the autopsy, there is no testimony save the dying statement of the person operated upon, which by reason of the carelessness or ignorance of the person hearing the statement is worthless as evidence.

Another form of declaration of deceased persons made competent evidence by a recent statute which will be likely to call physicians into court to some extent hereafter is the law passed in 1898, Chapter 535 of Massachusetts Laws; this will be used in civil cases only; it is entitled, "An Act Relative to the Declarations of Deceased Persons." It reads: "No declaration of a deceased person shall be excluded as evidence on the ground of its being hearsay, if it appears to the satisfaction of the judge to have been made in good faith before the beginning of the suit and upon the personal knowledge of the declarant."

In closing this paper it is proper, perhaps, to say that in speaking on the occasional failure of some person to comply with the exact legal requirement of the particular situation, it is with no desire to criticise, but on the contrary with a full recognition of the aid received from physicians and also of the fact

[12] Peck v. State, 86 Tennessee, 259.

that in most instances every requirement of the rules of evidence is complied with. The abortionist, the poisoner and the murderer would often have very little to fear from the best efforts of lawyers seeking to prevent crime were it not for the skill, the watchfulness and the fearlessness of the trained minds which trace the evidence of subtle poison or the course of the murderer's bullet. Without this assistance, in many instances the law would be helpless, and the fact that detection is made certain by the attainments of these scientific men restrains the criminal by bringing close to him the certainty of detection.

DISCUSSION.

DR. WHITNEY: I should like to ask if in the case of a dying declaration which has been made before the person admits his belief that he is in this extreme condition, he then reaffirms the story, after his conviction is expressed, would this be sufficient?

MR. SUGHRUE: Quite so; if the reaffirmation is made with sufficient distinctness, and it is a part of the statement. The danger is in the strict requirement to conform to the rule of law. The objecting lawyer might say that the reaffirmation did not reaffirm that the statement was sufficiently covered, but that would never occur when the sequence follows, as suggested in the paper; it would be perfectly good, if complete, under the rule of law.

DR. MEAD: I should like to ask if it adds strength to the declaration to have the defendant at the bedside when the declaration is taken.

MR. SUGHRUE: Not to the declaration; but it makes it not only a declaration, but another kind of evidence. It is very frequently the case that when the defendant is present, and a statement is made inculpating him, he makes some answer that is apart from the dying declaration; it then becomes subject to the ordinary rule of evidence, and competent to be used against him.

DR. MEAD: Is it advisable to have the defendant there?

MR. SUGHRUE: It would be a question of expediency rather than otherwise, having in mind the temperament of the person whose declaration was sought.

DR. HOUGH: I would like to ask if it is extremely unusual to find that a dying declaration is false?

MR. SUGHRUE: I think that it is. More can be said in favor of it than of any kind of testimony. It is argued that here is a person who has every reason to tell the truth; who is beyond any expectation of any interest to serve him; who is, ordinarily, under religious injunction to tell the truth, and whose condition is the best safeguard of the truth itself; and I think that it is generally accepted by juries as the very best kind of evidence and as being much more infallible than any other.

DR. HOUGH: I would like to mention a case that has come under my observation. An injured man, being informed by a physician that he was surely about to die, having received extreme unction, he being a Catholic, in the presence of the priest and the attending physician, and in the presence of the defendant, whom he identified, told an absolutely false story of the crime.

The hearing in the district court found the defendant to be unimpeachable, and the testimony went to show that the homicide was in self-defence, and the defendant was not even brought before a grand jury, the evidence was so strong in his favor.

DR. BUCK: I would like to add another case — a case of abortion, where the victim fully expected death and received extreme unction, and her dying declaration was taken down. She did recover, however, but that declaration was false. The case was never brought before the court, yet, if it had been, if the victim had died, and there had been occasion, the declaration would have been found false.

I should also like to ask whether it is advisable to multiply the witnesses, whether it would be well to have more than the physician, or more than two witnesses, when a dying declaration is made.

MR. SUGHRUE: I should say have no additional witnesses usually. If the statements are taken down in writing, it would be well to have any number of witnesses to testify to the fact that these were the statements made. If the statements were not written, if the declarations were oral, every witness would remember the facts somewhat differently from every other, either adding something to, or taking something from, the statement itself, and in that case it would not be advisable to have a number present. Two are quite enough, and in many cases two witnesses are one too many in an oral declaration. But if the statement is taken down in writing, then simply multiply the number present to give evidence to the fact that the statement was made.

DR. BUCK: Is it better to have the declaration written and signed?

MR. SUGHRUE: It adds something to your testimony. You have then the material fact, something besides the recollection of the witnesses; you have the material fact in writing.

DR. BUCK: I should like to ask another question. Is it essential that a physician should receive this statement in order that he may testify as to the certainty of death in the mind of the person, or would a layman's opinion be sufficient?

MR. SUGHRUE: That is purely a practical question. The testimony coming from a physician, if the physician had stated to the declarant his opinion as to death and received a response, would come more fittingly and more convincingly from him than from a layman. There would be no difference in the testimony except for that reason, that the declarant would be more apt to have that sort of a conversation with a medical man.

DR. PERKINS: I have a case now coming up which I expect to be thrown out through a failure in the dying declaration. The trouble with it is that when we come to look it over carefully in different parts of the statement, the declarant has apparently contradicated herself; it is not of much importance in itself, and only a small part of the declaration; but the fact that she contradicated herself was thought an important matter, and the court might properly throw the case out before it comes to grand jury.

MR. SUGHRUE: I do not think that it would be thrown out. The fact that

parts of the statement are contradictory would affect the story, but not the competence of the declarant.

DR. PERKINS: The contradiction was only a small part of the statement. The case was one where a man was arrested for killing his wife, and she said in her declaration that he threw an oil stove at her, and later she stated that as she stooped to pick it up he kicked it at her. This contradiction was not noticed at first, but appeared afterwards when it was read over, and we expected that the declaration would be thrown out.

MR. SUGHRUE: Perhaps as important a thing as I can say in conclusion is this. It is, unfortunately, frequently the case that a physician will hear the story of the dying person, and get a full recital of the case, of the crime and of the criminal, and then will ask the person if he is conscious that he cannot recover, and if he says that he is conscious, and makes no further statement, but rests there, that declaration cannot be used. That is a condition with which prosecuting officers are confronted. Physicians should remember that it is extremely important that they should first obtain from the declarant the conviction on his part that there is no hope of recovery, and then obtain the recital; then there is no trouble when the evidence comes in, otherwise it is of no importance, and the testimony can never be used.

APPENDIX.

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THE CORONER SYSTEM IN THE UNITED STATES AT THE CLOSE OF THE NINETEENTH CENTURY.[1]

BY S. W. ABBOTT, M.D., BOSTON.

In the following paper I propose to show as concisely as possible the present status of the coroner system in the United States, as derived from an examination of the latest compilation of the statutes of each of these States. A very good and complete digest of such laws as they existed twenty years ago may be found in Lee's "Handbook for Coroners," published in 1881, in which the laws are quoted in full as they then existed.

The office of coroner has probably existed for a thousand years, possibly for a longer period. The system appears to have been well established at the time of Edward I of England (thirteenth century), since, in the Statute 3 of Edward I, 10, the methods employed at the coroner's inquest appear to have been quite fully described, and the rules of action definitely laid down.

Connected with the coroner system in early times were many singular customs which appear to us today quite as absurd and useless as some of the remaining adjuncts of the system as it now exists among most English-speaking people. I shall allude to only two of these.

Any personal chattel, animal or thing, forfeited to the king for pious uses, on account of its having caused the death of a human being, was termed a deodand (*deo dandum*). Blackstone traces the custom back to Greek and Jewish laws, which required the destruction of anything which caused a man's death, the notion of the punishment of the animal or thing being implied. Certain peculiar distinctions existed in relation to deodands, as, for instance, between objects in motion and objects standing still. If a horse or any other animal in motion killed any one, either infant or adult, or if a cart ran over him, it was forfeited as a deodand. If death was caused by falling from a cart or a horse at rest, the law made the chattel or animal a deodand if the person killed were an adult, but not if he were a child. If death was caused by a thing not in motion, that part only which was the immediate cause of death was forfeited. If one were climbing upon the wheel of a cart, and were killed by falling off, the wheel only was a deodand. If the cart were in motion and ran over some one, the whole cart and its burden were also forfeited. Similar distinctions prevailed with reference to vessels at anchor and under sail.

The finding of a jury was necessary, not only to determine the facts, but also the value of the chattel which was thus decided to be a deodand. The

[1] Read before the Society, June 5, 1900.

nature and value of the weapon or chattel must be distinctly stated. This singular custom became deservedly unpopular, and juries interfered with the action of so unjust a measure, until the act of 1846[2] provided that there should be "no forfeiture of any chattel for or in respect of the same having caused the death of a man, and no coroner's jury sworn to inquire, upon the sight of any dead body, how the deceased came to his death shall find any forfeiture of any chattel which may have moved to or caused the death of the deceased, or any deodand whatever; and it shall not be necessary, in any indictment or inquisition for homicide, to allege the value of the instrument which caused the death of the deceased, or to allege that the same was of no value." With the numerous accidents constantly occurring at the present day, on sea and on land, on railways, street cars, steamers and other conveyances, such a law would be productive of great inconvenience and obstruction to public travel.

The term *felo de se* is nearly synonymous with suicide. It has, however, occasionally a more restricted significance when applied to "any one who commits an unlawful malicious act, the consequence of which was his own death, as if, attempting to kill another, he runs upon his antagonist's sword, or shooting at another, the gun bursts and kills himself." For many centuries it was the custom in England to bury each *felo de se* on the highway with a stake driven through his body. This ignominious form of burial was abolished in the reign of George IV, by an act of Parliament which ordered the burial of the body of a *felo de se* within twenty-four hours after the inquest, between the hours of nine and twelve at night, and without the rites of Christian burial.

The following is a condensed statement of the coroner system as it now exists throughout the United States: The laws in all the States without exception bear the marks of English origin, and afford the strongest evidence that English laws and English customs, once implanted in a new soil, are only uprooted by the most vigorous efforts, and the presentation of convincing evidence of a necessary change. English laws and customs are almost coeval with the marvellous spread of the English language and its hold upon nations. Habitual inertia toward the acceptance of new and improved methods and a tenacity in retaining old and established usages and ways of action, even in the face of evidence showing the need of better methods, is a peculiarity of our race. The marvellous discoveries of recent years, which have emanated from the schools and laboratories of Berlin and Paris, and other Continental cities, have usually been accepted at London only after mature deliberation, and even then with tardy acknowledgment.

This habitual slowness undoubtedly accounts for the fact that English-speaking communities are extremely slow to adopt better and more rational methods for dealing with deaths from violent and sudden causes.

Laws relating to coroners' inquests may be found in the early statutes of all the States as part of the legal machinery under which those States

[2] 9 and 10 Victoria, c. 62.

were established, and, going still further back, this is true of the colonies which existed in the seventeenth and eighteenth centuries, down to the Revolutionary period.

One of the best statements of the coroner laws of the Massachusetts Colony is that which appears in the statutes of the year 1700, chapter 3, enacted June 10th of that year. Eighteen jurors were summoned, of which number fourteen were sworn in sets of three or four. Two oaths were administered to them. The fee of the coroner was then ten shillings per day, and that of the jurors two shillings each. As new colonies were planted, and, still later, as new States and Territories were established, the same ancient method was invariably adopted with slight variations, for want of due care in searching for a more rational model, and it was not until the last quarter of the present century that our own State broke away from the established usage and adopted the excellent system under which medico-legal inquiries are now conducted.

The coroner, the inquest and the jury exist in nearly all the States in practically the same form. Rhode Island and Connecticut have imitated the example of Massachusetts, but not in so radical a manner.

There are, however, certain minor points of difference among the States, to which I will now refer. These relate chiefly to the functions of the coroner's office, the mode of his election or appointment, his fees, the number of the jury, and the employment of medical officers. The vicarious duties of the coroner, whereby he was occasionally required to perform the duties of sheriff, were also copied from the English statutes, and certain still more incongruous duties have been added in some of the Western and Southern States.

In some of the States an inquest may be held in the case of a person who is seriously wounded, and in imminent danger of death. In Indiana the jury was abolished by an act of 1879. In Texas also an inquest is held without a jury. In Alabama the coroner must be keeper of the jail, if the sheriff is imprisoned. In Kentucky the coroner may hold an inquest in cases of house breaking. In several of the States the coroner is a conservator of the peace, and must suppress riots and disturbances and may apprehend and commit felons and traitors. In Mississippi the coroner is also the county ranger, and it is his duty to take charge of stray horses, mules, jacks, cattle, sheep and hogs.

The modes of election are quite diverse. In Alabama, Arkansas, Colorado, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Nebraska, New Jersey, Nevada, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Washington, Wisconsin and Wyoming the coroner is elected by the inhabitants of the county. In Tennessee he is appointed by the county court. In Virginia also the county court appoints a coroner for two years and can appoint more if necessary. In Illinois, Indiana, Maine and New Hampshire the governor appoints the coroner.

In Texas, Vermont and Utah the office of coroner (under that name) is

unknown, a justice of the peace acting in all cases where the presence of such an official is required.

The fees of coroners are also quite varied. In New Hampshire the fee for holding an inquest is $1.50, in some States it is $5.00 and in others $10. The fees for recording, for mileage and other items also present a considerable range of variation. In some States, by recent statutes, stenographers may be employed at inquests, payable either by monthly salary, as in Kentucky, or by fixed prices for the amount of work performed.

In several States physicians receive regular appointments for aiding the coroner in his official work. In others the coroner selects any one whom he prefers for the time being. The compensation of such physicians ranges from $6.00 in Minnesota to $50 in some States for an autopsy, and $100 in Mississippi in cases where the body is exhumed. In Missouri the fee for an autopsy is $10, but if the coroner makes it, it is $25. In New Jersey the coroner may provide grave clothes for nude bodies at an expense of $1.00 each.

In several cities of the United States the coroner is a salaried officer, this being the case in New York, Philadelphia, Detroit, St. Louis, Cincinnati, Cleveland, Washington, Charleston and other cities, a plan which has obvious advantages.

The requisite number of jurors is usually either six or twelve. In New Hampshire three only are required, in Louisiana five and in Tennessee seven. In several States the number of jurors summoned is larger than the number sworn for the inquest, the number thus summoned ranging from nine to twenty-three.

The amount of bond required of a coroner varies from as low as $250 in Colorado, to $50,000 in the large cities of Ohio.

The jury is usually selected from the inhabitants of the town or county. In Iowa, North and South Dakota, from the "electors." In Kentucky they must be "housekeepers." In Utah they must be "qualified residents." In Washington a juror must be a "male inhabitant over twenty-one years old and of sound mind." In West Virginia he must be "a suitable resident." In Washington a jury is thus defined: "A jury of inquest is a body of men, six in number, summoned from the qualified inhabitants of a particular district, before the coroner or other ministerial officer to inquire of particular facts."

In Wisconsin the coroner is *ex officio* a deputy fish and game warden, and must assist the State warden upon due notice. He must resign to the sheriff, who transmits his resignation to the governor. The coroner must also make complaint as to violation of the statutes relative to the sale of liquors to Indians. In Colorado the coroner may be held for bribery and assault. He cannot practise as an attorney. He must investigate mining accidents and must also seize gambling implements, take snares, traps, nets, etc., and is liable to very many penalties.

Whenever a reform is proposed in any department of the government, every species of argument is employed for the purpose of convincing the law-

making authorities. Arguments from the moral standpoint, from the sanitary standpoint, from the patriotic standpoint, all have weight, but experience has shown that the economic argument has usually proved the most successful in the end. An appeal to the public purse is usually the appeal which wins. It was shown after three years' experience in Massachusetts that the abolition of the jury, and the introduction of a system requiring investigations by skilled practitioners of medicine in every case of violent death, had not only wrought a marked improvement in the method of work, but had resulted in a material financial saving to the State. In the city of New York in 1898 the coroners estimated the expense of conducting their work for one year at $239,050, or about seven cents per capita for the city of Greater New York. In Massachusetts in the same year the cost was only one and one-third cents per capita, or less than one-fifth as great, and this too over a territory of 8,000 square miles.

There are in the United States about 3,000 counties, in the majority of which a coroner exists by law. There are also at least 100 cities of sufficient size to require the continuous services of at least one medical man for medico-legal work of this character. There is no valid reason to prevent the medical profession from taking the initiative in this much needed reform. The old-time coroner is a foe to medical progress, and it is time to "move on his works."

AUTOPSIES AND PHYSICAL EXAMINATIONS.[1]

BY DISTRICT ATTORNEY R. O. HARRIS, EAST BRIDGEWATER, MASS.

MR. PRESIDENT AND MEMBERS OF THE MASSACHUSETTS MEDICO-LEGAL SOCIETY: — Since I, somewhat rashly, agreed to read you a paper on the subject of "Autopsies and Physical Examinations," I have been afraid that you might feel that I had undertaken to invade your province and deal with a subject better understood by you than by me.

The two professions of medicine and law should go hand in hand in search of truth. Medicine, in capital cases, must often go first, and upon her judgments must the law base its proceedings. I find, in discussing the matter with physicians, that there are two opinions as to the purpose of the autopsy.

One school, if I may so term it, holds that the duty of the post-mortem operator is only to ascertain the proximate cause of death, and that the manner in which death came is of no concern to him. That is to say, if a man is found dead, with skull split or crushed, and a bloody axe or club is found near by, the operator can report the proximate cause of death as wounds upon the head, and that the axe or club would be an instrument adequate to give such wounds.

The other school holds that the operator is also an examiner, and that every detail should be noted, both of appearances upon the body, and of surrounding objects, and furthermore that nothing should be assumed or taken for granted. The latter opinion is the better one, and the reason is not far to seek. The very purpose of the autopsy is to obtain information, evidence. The examiner should therefore approach his case with mind open, unbiased and unwarped by theories or opinions. He should note *every* abnormal appearance. He should also note carefully the appearances following upon his own operations. The contents of stomach, bowels, bladder, and other organs should be accurately observed. Surrounding objects ought not to go unnoticed.

Very many of these things may be noticed and not reported. Above all, in a case when, by any possibility, a charge of unlawful killing may be made, judgment as to the *manner* of the killing ought to be suspended. The medical examiner is not a prosecutor; he has no power to commit or examine parties. His duty is to ascertain facts within a certain field, and instruct the officers of the law in regard to them. He cannot anticipate explanations

[1] Read before the Society, June 5, 1900.

or defences. If careful and thorough in his work, however, he can pass upon them when offered, and tell whether they are good.

This, I fear, may seem trite and uninteresting to you, and you may say that of course we should do all these things.

The experienced medical examiner, who has been in many trials, will do these things, because the importance of what I say has probably been borne in upon him at some time, and with great force. Let me cite a few instances out of my own limited experience.

Several years ago a woman, of some seventy years of age, was found dead in her house. The body was found doubled up like a jackknife, in a closet, the door of which was closed. After the door was opened they could not close it again, owing to the rigidity of the body. The medical examiner, a skilful and intelligent man, called in another to assist him in performing the autopsy. Marks, as of fingers, were found around the throat. Evidences of death by strangulation were abundant, and vomitus was found in the windpipe and air passages. Death by violence was clearly established, and the *proximate* cause of death was clear. The physicians were not content to stop there, and examined the body minutely. A very slight abrasion or bruise upon the genitals led to examination of the vagina, and rape was clearly shown. The subject, both in age and personal appearance, had passed the time when one would have expected her to be the object of either solicitations or sexual attack. The choking might well have had robbery as its motive, and an examiner would be tempted to stop with that. The rape, however, once demonstrated, care required examination of the contents of the stomach and all the organs. The stomach assisted to fix the time of day when she died, as the remains of the last meal were found upon the table. No such food as the defendant told about was found either upon the table or in the stomach. The examiners were thus able to stamp his story as a lie. The rigor mortis also helped to establish the time. No one could possibly have anticipated what the story of the defence would be, but the complete *examination*, as well as autopsy, enabled the prosecution to bear down the defence completely.

In another case, again of an old woman, upon opening the head, the brain was found to be edematous, and the heart affected, and the proximate cause of death was apparent. Again a bruise upon the genitals, slight and easy to be overlooked, led to examination for rape. That once demonstrated, other bruises on the hands, arm, and legs, all slight, and none of fatal character, told a story much more important than that told by heart and brain. A bullet hole in the back of the head tempted one examiner to form his conclusion, and stop his examination. Upon being urged to go further, another hole was found, and the discovery changed the whole theory of the *case*. The word *case* I use advisedly, as the examinations are made with a view to gaining exact knowledge of facts, for use in further proceedings, not medical, and in the course of which the physician's may be a small, although very important, part.

It is impossible to anticipate the theories that may have their origin in the necessities of a defendant who has the assistance of ingenious and intelligent counsel. Unimportant bruises upon the body of a man that shows apparently clear evidence of foul and wilful murder may be the foundation for a theory of killing in self-defence, or at most of manslaughter.

The autopsy, at least the exact and careful autopsy, can be made but once. Only by thorough observation will you be able to successfully meet all theories, to fully answer all questions. Any one of you may be called in to assist at an autopsy at any time, and I am, unduly, perhaps, but earnestly, trying to impress upon you all the need of care. There are two parties who have a right to demand it, the commonwealth and the accused. The commonwealth, while prosecuting all cases, never intends to convict the innocent, or to ask more than is due. The accused, when his time comes to speak, may state a case which some apparently trifling mark or condition, in its relation to something else, may substantiate. He is entitled to the benefit of your knowledge and of your testimony. Failure to observe, and consequent inability to testify to the existence of such mark or condition, will carry the presumption that it did not exist, and may deprive an honest defendant of his life or his liberty. I have spoken of care in observing the results of your own work. Recently one of the most skilful operators in the State had to face the proposition that the appearances in the vagina that were claimed to be evidence of rape were caused by him in the course of post-mortem operation. Absurd as it seems, it was yet seriously urged that the lower blade and end of the entrotome scissors, in the hands of a skilled examiner, caused the tears that are characteristic of rape. The experts for the defence finally took the ground that it "was possible, but not probable." Could the theory have been anticipated, the positive answer would have been ready. As it was, the surgeon could only say that he did not cause the wounds. Probably no one believed that he did, and yet it was a suggestion of a possibility, and such suggestions, in capital cases, are sometimes as good as proof. The operator who has to admit that he did not observe any abnormal appearance, or the results of his own work, may sometimes find himself in the uncomfortable position where he knows, but yet cannot testify as of his own knowledge.

Passing from the autopsy, and coming to physical examinations of the living, I am aware that I come upon dangerous ground. Let me preface what I shall say by the remark that my own profession is open to much criticism in the matter of expert testimony. I am aware that it is, by some, looked upon as legitimate to construct a theory, and go from expert to expert until one is found who will testify to suit. Still, the average practitioner goes to his expert for an unbiased opinion, seeking only to know how much of a case he has got from the medical side. It is a trifle disturbing and dazing to have a man whose skill as a specialist in certain sorts of cases is well established, and to whose care you would give yourself for treatment, tell you that a client who has been in a railroad smashup isn't hurt, but is "faking."

When one has known a person in health and vigor, has seen him emerge from a wreck, bruised, shaken, lame, and in such condition that he has to be put to bed; when in the train of the accident come positive symptoms, noticed by physicians, nurse and family, symptoms that never before existed, it is disheartening to have your specialist say that they have nothing to do with the accident, but are merely "coincident." I have known of a physician's refusing to see an injured person, and saying that such an accident or injury could not possibly account for the conditions that followed, and that the patient must be lying. Even when a skilful and reputable local physician has observed and treated positive troubles, which the nurse has had to give attention to, troubles which followed immediately upon the receipt of a heavy blow, I have had the expert calmly declare that physician and nurse must be telling untruths, or the symptoms must be concurrent without being consequential, because in his opinion no such trouble could result from such an injury.

We who are not physicians believe that the swelling that follows when we bump our heads is caused by the blow; that if we are well and sound one minute, and the next are a mass of bruises and lameness as the result of a railway or other accident, the lameness and subsequent disturbances are attributable to the collision. The tendency is to divide men who are supposed to be, and who are in fact, learned and skilled men in surgery into two camps, plaintiff's experts and defendant's experts, the members of one ready to agree that almost any result may come from any injury, the others poohpoohing at everything and saying, "impossible, impossible," to everything. The result is that the expert has become a partisan. He cannot treat his *case* as he does his patients, disinterestedly. He is bound to one side of the case, and is always a plaintiff's or defendant's expert. This has become so marked that some men will say to us when we seek their opinions, "Go to So-and-so, he is more sympathetic than I am; I can't testify for a plaintiff," or else, "I am not the man you want; So-and-so is a good defendant's expert." These things have been said to me when I have gone to good men, whom I have met in cases and found to be skilful.

This may seem to you like mere scolding, but you must remember that it comes from a member of another profession. I try on both sides; I have to consult your profession; and I can see no reason why, if it chances that, when trying for the plaintiff, I meet a physician whose opinion seems to me to be entitled to weight, I should not consult him when I need a man for the defence to instruct me as to medical facts or probabilities. All I want is his best knowledge; when I get that, I can shape my own course. As in the case of the autopsy, the physical examination is for the purpose of gaining information, evidence; of establishing that a condition does or does not exist and testifying accordingly. It is not intended for the purpose of enabling you to ascertain conditions, and then raise theories to account for them that have no foundations except in theory.

You come to us for opinions in law, based on facts stated, and you do

not want us to suppose some other facts and give opinions based on them, and you do not want us to tell you that your facts are mere imagination.

Pardon me for being so long, but believe me that I am moved to say what I have only by my desire that our two great professions may be held in the esteem to which they are entitled.

THE CO-OPERATION OF THE MEDICAL AND LEGAL PROFESSIONS.[1]

BY GEORGE A. SANDERSON, ESQ., BOSTON.

"Of law there can be no less acknowledged than that her seat is in the bosom of God, her voice the harmony of the world. All things in heaven and earth do her homage — the very least as feeling her care; the greatest as not exempted from her power."

THIS definition of law by Hooker is comprehensive enough to include all the professions.

The law as it is practised today is the outgrowth of human experience. The rights which it enforces and the wrongs which it redresses were based in the first instance on expediency, and they have in time become a system of principles. The development has been usually in line with moral principles, although the law does not undertake to enforce every moral obligation as a legal duty.

The problems of the physician as well as his daily occupation lie almost wholly outside the range of the lawyer's experience. It is not often that a physician is in a position in his profession where he cannot do the work in hand without the assistance of an attorney, but the lawyer constantly has work to do which it is impossible for him to accomplish without the assistance of the medical expert. It is here that the two professions most often and most closely meet. The points of contact are so many and so important that knowledge of medical jurisprudence, which has been defined to be "the application of every branch of medicine to the purposes of the law," becomes almost indispensable.

The purpose of the Massachusetts Medico-Legal Society should be, in part at least, that the legal aspects of the physician's work may be emphasized, and that the medical and legal professions may be brought into closer relations with each other.

The complete dependence of the courts and attorneys on the physician's knowledge is illustrated in the most important trials known to our State courts, namely, trials for murder. I doubt if a murder case is ever tried or can be properly tried without the testimony of one or more men specially trained and skilled in medicine.

In Commonwealth *vs.* Rogers, the defendant was indicted in 1843 for the murder of Charles Lincoln, Jr., warden of the State Prison. The defence was insanity. Chief Justice Shaw, one of the most eminent of the men who have held judicial position in this Commonwealth, defined certain tests of insanity. "A man is not to be excused from responsibility if he has capacity

[1] Read before the Massachusetts Medico-Legal Society, October 3, 1900.

and reason sufficient to enable him to distinguish between right and wrong as to the particular act he is then doing, a knowledge and consciousness that the act he is doing is wrong and criminal, and will subject him to punishment. In order to be responsible, he must have sufficient power of memory to recollect the relation in which he stands to others, and in which others stand to him; that the act he is doing is contrary to the plain dictates of justice and right, injurious to others and a violation of the dictates of duty."

The court also said that an insane delusion will be an excuse for a criminal act if it "is such that the person under its influence has a real and firm belief of some fact, not true in itself, but which if it were true would excuse his act."

This case has a special interest for medical men, because the chief justice discussed the question of medical evidence. He said: "In general, it is the opinion of the jury which is to govern, and this is to be formed upon the proof of facts laid before them. But some questions lie beyond the scope of the observation and experience of men in general, but are quite within the observation and experience of those whose peculiar pursuits and profession have brought that class of facts frequently and habitually under their consideration. . . . A familiar instance of the application of this principle occurs very often in cases of homicide when, upon certain facts being testified to by other witnesses, medical persons are asked whether in their opinion a particular wound described would be an adequate cause, or whether such wound was, in their opinion, the actual cause of the death in the particular case. Such a question is commonly asked without objection; and the judicial proof of the fact of killing often depends wholly or mainly upon such testimony of opinion. It is upon this ground that the opinions of witnesses who have long been conversant with insanity in its various forms, and who have had the care and superintendence of insane persons, are received as competent evidence, even though they have not had opportunity to examine the particular patient, and observe the symptoms and indications of disease at the time of its supposed existence. It is designed to aid the judgment of the jury in regard to the influence and effect of certain facts which lie out of the observation and experience of persons in general. And such opinions, when they come from persons of great experience, and in whose correctness and sobriety of judgment just confidence can be had, are of great weight and deserve the respectful consideration of a jury. But the opinion of a medical man of small experience, or of one who has crude and visionary notions, or who has some favorite theory to support, is entitled to very little consideration. The value of such testimony will depend mainly upon the experience, fidelity and impartiality of the witness who gives it."

The chief justice further said: "One caution in regard to this point it is proper to give. Even where the medical or other professional witnesses have attended the whole trial and heard the testimony of the other witnesses as to the facts and circumstances of the case, they are not to judge of the credit of the witnesses or of the truth of the facts testified by others. It is for the jury

to decide whether such facts are satisfactorily proved. And the proper question to be put to the professional witness is this: 'If the symptoms and indications testified to by other witnesses are proved, and if the jury are satisfied of the truth of them, whether, in their opinion, the party was insane, and what was the nature and character of that insanity, what state of mind did they indicate, and what they would expect would be the conduct of such a person in any supposed circumstances?' "

The case of the Commonwealth *vs.* Lorenzo W. Barnes, tried in Middlesex in May, 1897, illustrates how several distinct lines of medical inquiry may be involved in one case. Barnes was charged with the murder of John Deane by striking him with an axe at Maynard, on December 17, 1896. Mr. Deane was left alone in his house by his daughters, who went to work in the morning of the day of the murder. They returned in the evening and found their father dead in a pool of blood on the kitchen floor. Two cuts with an axe had been made in the head and neck, one of which severed the spinal cord. No one had seen the murder committed, and no one had been seen going to or from the house.

Late in the afternoon of the day of the murder, about twilight, Barnes asked for a ride into Maynard from a short distance outside the town. He was on the road which led from Mr. Deane's house, and was some distance from it. He visited a bar room and washed his hands. He bought a new pair of boots and threw his old ones over a bridge. These boots remained on the ice of the river until the next day, when they were taken by one of the witnesses and given, with Barnes's other clothing and the axe, to Professor Wood for examination. He was able to point out many spots on the boots, trousers and coat worn by Barnes that were consistent with being human blood; and he also showed by the shape and appearance of many of the spots the direction from which the blood had come and something of the force with which it hit the object.

He was able to testify from investigations that an invariable rule is that in pear-shaped blood stains the stem of the pear is away from the source from which the blood comes; that the bulk of the blood in a stain is at the farther point from the source except in cases where the blood impinges upon a smooth surface, and then the force of gravitation will carry the bulk of the blood to the lower portion of the stain.

The blood stains on the boots were explained so fully that they made a very important part of the evidence. The direction from which the blood must have come and its distribution on the boots were consistent with results which would be expected if the boots were worn by the man who struck Mr. Deane with the axe.

The professor was able also to testify that some of the blood marks on the axe handle were finger-print marks. There was another matter along this line which was to be developed, namely, to take impressions of the hands of Barnes and, comparing them with the finger prints on the axe, to prove that the hand of Barnes must have made the marks upon the axe. The results of

this experiment could not be known before the trial, because it seemed better not to take an impression of Barnes's hands while he was in jail awaiting trial. I understand that the impressions were obtained with Barnes's consent after the verdict, but I do not know what conclusions, if any, Professor Wood has reached in the matter.

The medical examiner gave in great detail the condition of the body, its position in the room when he arrived, as well as many important facts about the table, stove, axe, chairs and blood stains in the room. He, of course, stated the results of his autopsy, giving the condition and appearance of the different organs of the body, the exact nature and extent of the wounds in the head and neck, and the cause of death. A model made or procured by him showing the place of the wounds greatly assisted the jury in understanding his statements.

The case was also interesting and important because of the issue of insanity that was raised and tried. Two experts on insanity were called by the defendant and four by the Commonwealth. The claim was made by the defence that the defendant received a sunstroke when three years old, which caused a lesion of the brain, and that he had always been weak mentally since that time. The defendant was lame in one leg, and it was claimed that the lameness was caused by the sunstroke. It was said to be an interference with the nervous structure which showed itself in the leg which was supplied by those nervous connections.

The position of the experts for the defence was not that the defendant could not understand the difference between right and wrong, but that his responsibility was of a limited kind. One purpose of this evidence was to show that the defendant's guilty conduct after the murder had no significance, because of his deficient mental condition. Another was that if he committed the crime, he had not mind enough to form that deliberate premeditation which is required in murder in the first degree.

The experts for the Commonwealth testified that in their opinion the lameness was caused by spinal paralysis.

They all testified that they had examined the defendant; that he could distinguish between right and wrong, and that he did not seem to have any irresistible impulses or delusion.

The defendant was convicted of murder in the first degree. An effort was made to have the sentence commuted to life imprisonment by the governor, based principally upon the ground of Barnes's mental condition. The governor appointed other experts in mental diseases, who examined the defendant and the evidence, and made report to him. The sentence was not commuted, and Barnes was hanged at East Cambridge on March 4, 1898.

In the case of Commonwealth *vs.* Barrett, tried in Middlesex in 1894, there was opportunity for special investigation into powder marks, and Dr. Mead's interesting account of the experiments which he performed with powder in connection with that case is contained in a published pamphlet which must have been read by many of you.

Each important criminal case seems to present some unsolved problem in medical jurisprudence, the solution of which must depend largely upon the medical witness.

The time of our civil courts which try cases with juries is largely taken up with tort cases, in which damages are claimed for physical injuries. In almost every case physicians testify on each side. The conflict of evidence between the physicians is usually great, both as to their observations of the symptoms and as to their opinions of the nature and extent of the injury. This class of cases cannot be properly tried without medical evidence. The facts to be established are outside the range of the jury's observations and knowledge. They must rely for the most important evidence bearing on the question of damages upon the testimony of the physician. It would be in the interest of obtaining proper verdicts if the best medical witnesses could be obtained to testify in these cases. But many times the best men will not attend court, because the waste of time is so great and such attendance makes a serious interruption in their regular work. The best experts deserve and demand for their time so large a compensation that the poor man cannot afford to employ them. Irresponsible witnesses often mean verdicts out of all proportion to the injury. It is not unusual that the court sets aside or reduces the findings of the jury.

The most apparent objections to the present methods of trying these cases are, (1) the great waste of time on the part of the physician; (2) the tendency to have in these cases incompetent and irresponsible experts, who enter the case without expectation of pay unless their side wins, and (3) the improbability of the award of proper damages either by a court or jury, even when the present system is working under the best conditions.

It is well known that the courts are assisted in reaching just conclusions in many civil cases, outside of this class of torts, by the appointment of masters, auditors, referees, or commissioners. This system saves the time of the court. It does not deprive a party of his right to a trial by the court or jury after the report of the master or other person appointed, but it does result in the settlement of many cases upon the finding of the master or auditor, and it tends to prevent either excessive or insufficient damages in the cases that afterwards go to the court.

If the court could in the same way refer to some physician of known ability and standing cases in which a medical question is involved for his investigation, either by personal observation or the taking of testimony or both, and for his findings of fact to be reported to the court, there would be a closer correspondence than exists today between the facts and the damages awarded in this class of cases. If a case thus investigated should afterwards go to a jury, the report of the physician to whom it had been referred might be given the same weight as is given to an auditor's report; namely, it would be *prima facie* evidence of the facts therein found. In other words, the facts so found would be decisive of that part of the case unless rebutted and controlled by other evidence.

If such a system should be introduced and adopted, matters of detail, such as whether the governor and council should appoint a number of physicians to whom cases could be referred, or whether some system of civil service rules should apply to their appointment, or whether the judge should be left free to select such competent physician as he should think best, could be determined. The demand for some such system as this has sometimes been recognized by judges and attorneys in referring cases to physicians to fix the damages, or to investigate and report the facts.

In the case of Copson *vs.* N. Y., N. H. & H. R. R., heard in 1898 by a single justice of the Superior Court without a jury, the claim was made that the injury to the plaintiff had caused a permanent condition of imbecility. The judge, after hearing the evidence, arranged that the plaintiff should be sent to an asylum to be constantly for some months under the supervision of a competent specialist in mental diseases. The judge delayed his finding as to the amount of damages to be awarded until he had received the report of this specialist.

In the case of Robbins *vs.* Fitchburg R. R., tried in 1894, the judge of the Superior Court ruled that on the evidence the plaintiff could not recover, and ordered the jury to find a verdict for the defendant. The full court decided that this ruling was erroneous, and that the question of liability should have been left to the jury. The case then being in order for trial by jury, the counsel for the parties agreed to leave the amount of the damages to the two physicians in the case, one of whom had been employed by the plaintiff and one by the defendant.

Another class of cases in which a medical tribunal would save the time and increase the effectiveness of our courts is that in which questions of sanity or mental and moral responsibility are involved. In most cases of committal to an insane asylum there is no contest, and the court simply accepts and acts upon the opinion of the physician. In all such cases it would be as well if the certificate of the physician could be used as evidence, and the expert be saved the trouble of attending court in the matter.

One of our best specialists on insanity said recently that physicians of standing in this specialty generally agree upon the essential facts, and also in their opinions, after they have made a thorough investigation of a case, and that he hoped the time would soon come when the certificates of such experts stating their opinions and reasons would be received as evidence.

A more comprehensive plan for dealing with cases of insanity would be to establish a court or board of physicians, with power to try questions of insanity, and to commit those who were found to be *non compos mentis.* Such a court might be given authority to investigate and pass upon questions of sanity which arise in cases in any court, their decision to be evidence if the case should go to trial before a jury.

Some such system would undoubtedly prevent the defence of insanity in most cases where this tribunal, after investigation, found the party sane. It would be a great convenience in criminal cases in which the question of sanity

is raised if the case could be referred at once to such a court or board for its investigation and finding. Courts having probate jurisdiction and civil courts generally would often call upon such a tribunal to investigate the questions which it would be especially qualified to answer correctly. This plan would not prevent the trial of the issue of sanity before a jury in criminal cases in which the defendant still desired to make the defence of insanity after the finding of this new tribunal that he was sane. In such case he would have a right to try this issue, and the witnesses on this question would be obliged to attend court and testify because of the constitutional provision which gives the person charged with crime the right to meet witnesses against him face to face.

I believe, however, that in the years to come there will be many improvements in our procedure in courts and in our methods of finding facts; that this improvement must be brought about by abolishing antiquated and circuitous methods and rules of evidence that prevent rather than assist in reaching the truth, and introducing more simple, more direct, more natural methods, excluding as far as possible all chance of error. It is because the medical man should decide medical questions and is most likely to decide correctly that the suggestions herein made seem to be in the line of progress.

Meanwhile we must make the best of existing conditions, and whether we have reforms in our methods of procedure or not, the demands upon the lawyer to know something of the medical side of the law, and the demands upon the physician to know something of the legal side of medicine must be met.

The physician cannot tell at the beginning of any day's work that he may not be obliged to qualify in court to testify to the medical facts connected with some case which he treats that day, and he would be expected to know not only what is necessary for a proper treatment of the case medically, but also what is required by the law for proper treatment in court of the medical side of the case.

If the physician knows what is required and permitted as evidence in court, he can note many facts which would otherwise go unnoted. It is often true that we see only what we are looking for, and it is only when we know what is evidence that we can look most intelligently for it. The medical examiner usually has a good working knowledge of proper evidence and I doubt not that every prosecuting officer in the State would say that the community is indebted to our medical examiners for their ability, their fairness, their thoroughness, and their care in making note of every point which may assist in arriving at the truth. It is often true that the medical examiner is the most important witness in our most important cases, and that his care in observing and stating facts has many times prevented a miscarriage of justice. His work requires him to be a specialist in many branches of medicine.

But the whole case has not been stated when we say that medical jurisprudence is a matter of great importance to both professions. A more significant fact than that to the man who wants to know what should be done now

is that every branch of medical jurisprudence is *growing* in importance and becoming a more essential part of our judicial system. The phenomenal growth of tort cases has been accomplished within a few years, and this class of cases must continue to increase with our greater industrial and commercial development.

The increase in the number of inmates of our insane asylums is ample evidence that this branch of medical jurisprudence must be constantly occupying a larger place in our courts.

The laws to regulate health and prevent the spread of disease must be greatly multiplied and systematized, as our population grows in the large centres, and our latest census returns almost alarm us with the great growth of all our cities. The increase of population must bring with it an increase of crime, although for some reason, and undoubtedly a temporary one, for the last one or two years there seems to have been a falling off in crimes and criminal prosecutions.

The embarrassment of the physician who is unable to meet the demands of a case in which he is called to testify is only exceeded by that of the attorney who knows little of the medical aspects of his case and little of the bearings of the medical testimony which he is required to present. His examination is likely to lead only to a confusion in the minds of the jury like that which exists in his own mind.

Notwithstanding the great change in the medical and legal courses in our universities, still it would seem that the importance of courses in medical jurisprudence has not been emphasized in either the school of medicine or the school of law. The neglect of this subject, in view of the increasing demand for the physician in court and the corresponding growing necessity that the attorney be able to properly present the medical testimony in a case, cannot be justified nor long excused.

If this subject is to be given its proper place in the training schools and among the members of both professions, it can most effectually be brought about by this organization, which stands between and unites the two.

May the time soon come when it shall be true not only that the physician shall know everything about his special branch of medicine and the lawyer shall know everything about his special branch of the law, but also when it shall be true that each shall know something of the whole range of medical jurisprudence.

DISCUSSION.

THE PRESIDENT: Gentlemen, you have listened to this very interesting paper by Mr. Sanderson which he has kindly brought here and read to us. I hope we shall have a full discussion, and I am sure that Mr. Sanderson will be glad to answer any questions that may have troubled you, both on this general subject that he has discussed or any particular subject that may occur to you. The paper is now open for discussion.

DR. HOUGH: In these cases of suits for damages for personal injuries that are so common, I think the one element that has impressed me as of the

greatest importance is the speedy settlement of the cases in one way or another. It is, I think, the general rule that the law's delays are extremely detrimental to the patient. Not that the patient, as a rule, tries to stay sick or lame or feeble as long as possible, but because there is something in the nature of the human mind that does retard recovery as long as a suit for damages is pending, and, so far as the speedy recovery of the patient is concerned, a settlement of the suit is quite as important in many cases as skilful treatment.

Perhaps that is taking an extreme view, but I want to impress upon you what I think is so important in those cases. It has been my fortune a good many times to have the opportunity to examine patients in these cases in conjunction with the physician representing the other party to a suit, and I am happy to say that almost without exception the medical gentlemen are able to agree as to the facts, and agree as to the probable outcome. The differences, if any, have been minor differences, in nearly every case where the physicians for the two sides have been able to meet and examine the patient and discuss the case. The greatest difficulty that I find is that the lawyer on each side considers the medical expert whom he employs as an assistant counsel in the case as retained for the purpose of bringing out, not the truth, the whole truth and nothing but the truth, but only that part of the truth which shall be an assistance to his side of the case. And the lawyers impress that upon the physicians to such an extent as to make it difficult for the best intentioned man to have that eye for the truth, the whole truth and nothing but the truth, which every one of us wishes to have in these cases.

Dr. Adams: I have listened with great interest to Mr. Sanderson's paper. It seems to me he covers all the points, and I do not feel as though I could add anything to it or say anything of assistance in the discussion.

Dr. Hartwell: Mr. President, I am sure we can profit by what our essayist has said in relation to questions that come before the medical profession. There is a question that is constantly before them, that will not down, and that is the question of what shall be done with expert medical testimony. You will remember, Mr. President, in a very able paper presented by Dr. Irish, of Lowell, a few years ago, he stated that the whole matter depended upon the character and ability of the expert himself, and that reference to a court of justice composed of medical experts, or any other manner of disposition by the judge of the court, was secondary to that. I feel, as Dr. Hough has stated it, that there is a very strong tendency at the present time to leave these matters out to some medical man appointed by the defendant's and by the plaintiff's attending physician, and it is, I think, for reasons which are plain. The defendant feels — and this refers particularly to actions of tort in the case of our railway companies, perhaps — that he is not properly represented by the jury; a jury capable of being influenced very largely, and mixed up, if I may use the term, by the medical experts on the different sides, and by the attorneys when they come before the jury with a summing up of such testimony. It is left to twelve men who know very little about medical

subjects, and I believe Mr. Sanderson has touched upon a very important elucidation, that it can be or should be left to the court to appoint those who may investigate.

One of our most celebrated experts in mental diseases in Massachusetts told me the other day of a tort case, in which a certain railway company in the State was the defendant, that was left out to him. He has had the patient two or three months now under his supervision, boarding in a private family near his home, and, with the consent of both parties, is trying to get at the exact truth, and will make a report to the judge in the case.

It seems to me, Mr. President, where cases cannot be decided between the defendant's physician and the plaintiff's family physician, that if the court can have power to give more authority to the expert than he has at present, that will place the matter where it will be more satisfactory to the parties involved. I believe there is a good deal in what Dr. Irish said, however. We have a law compelling all medical men practising in the State to be educated in medical matters, and I believe that a very great deal depends upon the honesty and integrity and capacity in medical subjects of the expert in question.

Dr. Draper: Mr. President, I have nothing to say except to thank Mr. Sanderson, the reader, for his very acceptable method of meeting matters which for many years, and at present, have been not so acceptable as they ought to be. It seems to me that he has touched a way to which we, as physicians, can all give our ardent approval, and, if need be, our help toward getting the matter out of the rut in which so long it has been. The trouble, as we all know, is that, under present methods, partisanship is not only common but inevitable. I do not care how conscientious a man may be who is employed as an expert. From the very beginning of his employment, from the very moment when the lawyer comes to him to ask if he will take the case, his conscience is necessarily laid one side and partisanship has the right of way with him. He cannot help it. It is unconscious, it is inevitable. To meet that sort of thing, the suggestion made by Mr. Sanderson seems to me a very pertinent one and a very acceptable one.

I do not know that I have anything further to say, Mr. President, except a single word of gratification that the essayist, himself representing the legal profession, appears to indicate that the legal profession is having its eyes opened a little bit to the very unsatisfactory way in which experts are employed by them out of and in the court; and if, in the future, these cases, in actions of tort where injuries are in question, where physical conditions are to be decided, can be left out to physicians as masters or as auditors, then we shall have taken a direct step toward results which I am sure we shall all approve.

Dr. Presbury: Mr. President, we have all been taught that it is good to hear the other side. We have had an opportunity today, as between the lawyer and the physician, again to hear the other side; and I am gratified at being able to call your attention to the fact that today it doesn't altogether

appear that all the faults in medical expert work are the faults of the medical side. I think we have had a very just and fair presentation of the difficulties and the faults, and a good and honest suggestion of what may prove a way out of our difficulties. We are all of us troubled, as physicians, with this system of advocacy which has been mentioned by all who have spoken before me, and our desire, I am sure, is to have that put one side, in order that we may, by whomever employed, seek wholly the truth and state wholly the truth. The reader, when he said that it was well that the medical men themselves should be the ones to pass upon medical subjects, because they were the ones best qualified, really touched the keynote of our whole existence. Without that there would have been no medical examiner. The whole idea in the work of the medical examiner was to put the investigation of certain unexplained deaths into the hands of men who had special qualifications for the investigation of such matters, and I think unknowingly he probably hit the real cause of our existence and the essence of our being. It is for us, then, if that is the cause of our being, so to conduct our work as to justify the plan which has made our existence possible. I am very much pleased with the paper that has been read. I think it is good for us to hear a statement of facts from lawyers as well as from physicians, and particularly gratifying to hear them so kindly and pleasantly made as in the paper of today.

Dr. Abbott: I have been much pleased with the clear method in which this paper has been presented, and I hope it is a sort of harbinger of something better to come as years go on. There is one case I call to mind which is an illustration of just this difficulty, and that occurred some twenty years ago at least. It was the case of the Smith Paper Company's dam on the Housatonic River. I think the number of medical experts called in that case was larger than has appeared in any other trial in the State or in New England. There must have been forty or fifty. The question was whether that dam should come down or not in consequence of the flats above it having produced malaria in that region. What was remarkable about the matter was that no one then knew anything about the cause of malaria. Those gentlemen went on the stand and they testified just according to which side they were paid for, and nothing came of the trial. The dam stands there now. It is only within the past ten years that light has begun to come to us upon this subject, and we do know now something about the causes of malaria; but that is only one of the instances showing a radical wrong in the present method of trials along this line.

Dr. Brown: I do not know that I can add anything more. One thought occurred to me, however, during the reading of the paper, when reference was made to the disagreement of experts so often, and that point is this: that we, as medical examiners, at least, should never let it appear before the eyes of a jury that we are partisans, however hard the attorney on either side may try to make it appear so. I know several times I have had the question asked me by the attorney, "You are a witness on the other side of this case?" and I take pleasure in replying, "No, sir, I am a

witness for the Commonwealth, to tell the truth, the whole truth, and nothing but the truth. I am here to testify in behalf of one side just as much as the other." I try to make it a point to impress the jury that I am not a partisan, and I try to impress upon myself that I will not be a partisan in a case, and I think we should all take that moral ground, and not allow ourselves to be partisans in a case, not to go in with any premeditated view, anything more than to get at the right and truth in the matter.

DR. ADAMS: Mr. President, a curious case comes to my mind, from my own experience, with regard to the lawyers. We have been talking, in what has been said, about the prejudice with which the doctor goes on the stand. It is certain that the lawyer that employs them expects the doctors to give evidence on their side, and I had a curious example of that once.

A friend of mine was a lawyer of some distinction, and he had a case which he was bringing for various riparian owners, of which he was one, to recover damages for the building of a dam. Now, without asking my opinion about it, he summoned me as a witness, and it so happened that my testimony, the moment I began to give it, was entirely against him. His case was, I feel sure, an unjust one. But, however that may be, it is certain that my testimony went entirely against him; and the result was that after I had returned from giving my testimony he said to me in the hearing of the court and loud enough for anybody to hear, "The witness on the stand has knocked our testimony all to pieces." I thought that a most extraordinary exhibition of partisanship, and the feeling with which he entered upon it when he put me on the stand was that I was certain to testify in his favor, assuming that a doctor who was summoned by him — his doctor — must necessarily testify for him, without having previously asked me what my testimony would be; showing that lawyers certainly enter upon cases of that sort, where they summon medical testimony with the idea that the physician is to testify for them whether it is the truth or not.

THE PRESIDENT: Mr. Sanderson, have you any desire to say anything in closing this discussion?

MR. SANDERSON: I think I have had my turn.

THE PRESIDENT: Then unless some gentleman has something to say we will consider the discussion at an end.

DR. F. E. JONES moved that a vote of thanks be given to Mr. Sanderson for his very interesting paper.

THE PRESIDENT: I am very glad, gentlemen, to put that motion, because I personally have enjoyed the paper very much, and I know this society will profit by it.

The motion was put and unanimously carried.

CRIMINAL NEGLECT; REPORT OF A CASE.[1]

BY A. W. BUCK, M.D., FALL RIVER, MASS.

THE choice of this subject is the result of experience not alone in the case to be reported, but from the impression, very firmly fixed, that in spite of maternal affection, which is an almost unfailing attribute of a mother, no matter how destitute or depraved, there still are cases where one's suspicions must be aroused that the neglect, though apparently due largely to ignorance, is in some degree wilful. Especially is this true where illegitimate children are concerned. The industrial insurance companies recognize the lack of care which these unwelcome guests receive in the majority of cases, and refuse to accept them as risks under the age of five years. Frequently enough we are called to certify as to the cause of death where it is evident that ignorance and wilful persistence in unfortunate methods have brought about the untoward result, where intended kindness has in reality been murderous. To such cases I do not refer, but to those in which the motive is apparently relief from a wearisome burden.

Infanticide has a harsh, barbaric sound, but I believe deaths sometimes assigned to natural causes could justly be attributed to the neglect (semiwilful, if it may be so called) of the mother, who, worn out and discouraged in the struggle to provide for herself and her offspring, is willing to yield the babe to the forces ever waiting for its destruction.

So far as I know, we do not have today in Massachusetts to any great extent the unhygienic "baby farms," which have at times appeared as most potent factors in carrying out the Malthusian theory. On the contrary, the summer home and hospital for sick and poor children have reduced the infant mortality to an appreciable extent. Frequently, however, we find the babe of a few weeks, whose mother must work ten hours of the day, consigned to the care of a neighbor whose only interest is to collect the dollar a week which is paid for the board of the little one.

It is difficult, almost impossible, to say just where negligence approaches criminality. Inquiry reveals more than autopsies can affirm. Starvation may be due to disease. Emaciation occurs in spite of the most carefully prepared diet. Cleanliness is a relative term among infants of the poor. The most anxious mother does not succeed in preventing sores unless she can intelligently devote all her time to her sick babe. Bruises are common to all children able to seek for them. These things will not prove lack of ordinary care, and one must seek further. The failure to provide medical attendance may be but an expression of the mother's lack of confidence in the efficacy of

[1] Read before the Massachusetts Medico-Legal Society, October 3, 1900.

medicine or the skill of the physician. These things combined may nevertheless be of value in determining the intent of the mother. And it is the intent, the motive, which the law recognizes as of prime importance.

The case I wish to report is that of a child aged seven months. The mother was a woman of twenty-five who was working in a cheap hotel as helper in the kitchen. She claimed to have been married five years. Her husband, however, had left her three years before, though she claimed he had been to visit her about a year and a half before the present time. The babe had been for six weeks at the Seaside Home, and though in a forlorn condition on its admission, had gained sufficiently to be thought ready to be discharged from the hospital. The mother was notified, but failed to call for it. During the six weeks of the child's stay at the home she had never been to see it, though opportunities were frequent. Repeated requests had no effect. Then the babe was taken by the overseers of the poor to the almshouse, where it remained two weeks. Our pauper methods, however, do not provide for maintaining a child in the poorhouse while its parent or parents remain outside. This mother, then, who was now supporting a child two years old, was told that she must either declare herself destitute and join her younger babe in the almshouse, or she must support it herself outside. And being summoned before the officers at the police station she declared herself able and willing to provide for both children.

As before stated, she was working at a cheap hotel, and this was within a stone's throw of the office of the overseers of the poor and the city physician. Evidently fearing that the proprietor might object to the presence of two infants, she said nothing of the younger child, but took it to her room, which was poorly lighted and ventilated. There for sixteen days the child was kept, never was taken from the room, no one was told of its existence. The mother manifested marked indifference as to the loss of the babe. She acknowledged that it had been sick for two weeks, but had not thought it necessary to send for a doctor. She knew the method of applying for the city physician, and had previously had him for the other child. She said that she had fed the younger child with milk when it would take food. She had given it soothing syrup when it cried. In the room there was a bottle labelled "soothing syrup," and a man who worked in the hotel said that he had been out for medicine (soothing syrup) several times. This he had supposed was for the two-year-old child. These facts were ascertained after noting the unusually filthy and neglected appearance of the body of the infant, and as a result an autopsy was held September 14th, forty-four hours after death.

The body was that of a male child twenty-five inches in length. It was extremely emaciated. Rigor mortis was present. The buttocks and genitals were red and inflamed. Vermin were present in the sores on the buttocks. The oral mucuous membrane was apparently normal. Almost complete absence of subcutaneous fat; skin dry and shrivelled; face pale and wrinkled. Heart and lungs were normal, though all the organs were markedly anemic. Stomach empty save for small amount of white, slimy deposit which was ac-

cepted as milk; bowels distended with gas, the walls thin and friable; the small intestine empty for its entire length; no signs of any inflammatory condition; large intestine also empty, but descending colon and rectum showed slightly inflamed mucous membrane which was everywhere else very pale. Gall bladder was full. Kidneys, spleen, liver and pancreas appeared normal. Brain was normal.

So far as could be ascertained from the autopsy, death had resulted from starvation, but the slight indications of colitis were sufficient to raise a possible doubt as to whether the starvation was due to disease or to the restraint of proper food. The mother was held by the district court on the charge of manslaughter, but she was not indicted by the grand jury.

Reese says that although starvation "is rarely the cause of homicidal death, it should always be remembered that the law does not require the absolute deprivation of food to be proved, but only the necessary quantity and quality to be withheld, provided this has been done with an evil intent." It is important to know that the evidence of organic disease does not disprove that criminal starvation may have been the cause of death. This because the defence set up is invariably that, admitting the cause of death, it was the result of disease and not of malice on the part of the one accused. Tidy quotes the statement of Hippocrates that "The old bear want of nourishment best; those who have attained the middle period of life the next in degree; those who have just arrived at puberty are less able to endure it; but that of all ages, childhood is the least capable of enduring hunger." It takes very little to kill an infant by refusing it the breast or giving it insufficient or improper food.

The burden of proof that the fatal result has been the outcome of wilful neglect on the part of the one having the care of a helpless child may at times not be light. The points particularly to be observed in these cases are those usually indicative of starvation. In chronic cases the body is invariably shrunken and greatly emaciated. A contracted state of stomach and bladder, a shrunken and transparent condition of intestines and omentum, with a more or less atrophied, but otherwise healthy condition of the viscus, appear to be the prominent post-mortem symptoms. In acute starvation, however, one may find a considerable layer of fat, as in the case of the Welsh fasting girl.

DISCUSSION.

THE PRESIDENT: This paper by Dr. Buck is now open for discussion, gentlemen. I think Dr. Abbott once wrote a very instructive paper on infanticide in the early days of this society.

DR. ABBOTT: It was an allied subject — still birth.

DR. HARTWELL: I would like to know if the soothing syrup used was Mrs. W.'s.?

DR. BUCK: Yes, it was. I expressed my wrath.

DR. HARTWELL: Some twelve years ago the legislature passed an act authorizing the State Board of Health to investigate the use and abuse of opium in the State of Massachusetts. In the report made at that time I think you will find Mrs. W's. soothing syrup was put down as a morphine simple syrup. I presume he considered that as a factor possibly in the infanticide in this case.

THE PRESIDENT: Has any other gentleman anything to say on this subject? If not we will consider the discussion at an end.

THE OPINION EVIDENCE OF MEDICAL EXPERTS.[1]

BY JOHN D. MCLAUGHLIN, ESQ., BOSTON,

Assistant District Attorney.

THERE are few branches of the law, particularly that of evidence, which have more than a general interest for those not of that profession. The subject, however, of expert testimony, and especially that of medical experts, is singular in that, apart from its own intrinsic importance, it excites equal concern in two great professions, the medical and legal. The interests of the physician and the lawyer (as well as of the layman whose property or liberty, when a party, may be intimately involved, or who, as a juryman, may be called to sit in judgment) here converge in a common centre. The discussion which has waged for years, and while present conditions obtain, will wage long hence, and the numerous proposals for reform in the reception of such testimony, has been about equally participated in by these several interests. Each from time to time, through the channel of medical journal, legal periodical or the newspaper, is contributing some thought or suggestion to the subject; and I cannot but believe that your society, whose end is the advancement of the science of forensic medicine, regards it, however trite, as one of surpassing importance.

Some months ago, I had the honor to read, before the medical society of a neighboring county, a paper in which I discussed the position of the medical expert as lawyers see him upon the stand today, and said, in passing, that the many proposed schemes of reform seemed to me speculative and impractical. In so far, at least, as I may have seemed by that remark to endorse the method which now prevails in England and America, I beg leave to disclaim that opinion.

When the physician testifies as merely an ordinary witness to facts which have come within his observation, he excites no greater interest or attention than that which might attend the testimony of an intelligent witness from any other vocation. His effectiveness, persuasiveness, and claims to belief depend upon the same conditions as do those of any witness. But when testifying to his opinion, based either on facts which he has himself observed, on admitted facts, or upon some hypothesis, expressing the judgment of a scientific man, ready to submit it to the

[1] Read before the Society, February 6, 1901.

opinion and criticism of the members of his own profession, to the cross-examination of counsel, publicly and to the world, then he frequently evokes an interest which rarely surrounds a witness under any other circumstances. There is, indeed, no phase of evidence which has attracted more attention, which has been the object of more criticism (frequently from bench and bar) or more the subject of proposed reforms than the opinion testimony of medical witnesses as uttered on the witness stand.

Of the scope and extent of such criticism, at least on the part of those who administer the law, we may derive a clearer and more concrete conception if I cite from a few of its most authoritative sources. I will content myself with quoting from a judgment of the Supreme Court of the United States, from the charge to the jury in a capital case of a former chief justice of this Commonwealth, and from the charge in a similar case of one of England's great judges.

Said Mr. Justice Grier in the case of Winans *vs.* N. Y. & Erie R. R. Co., 21 How., 88, 101: "Experience has shown that opposite opinions of persons professing to be experts may be obtained to any amount; and it often occurs that not only many days but even weeks are consumed in cross-examinations, to test the skill or knowledge of such witnesses and the correctness of their opinions, wasting the time and wearying the patience of both court and jury, and perplexing instead of elucidating, the questions involved in the issue."

Said Chief Justice Chapman, at the trial of Andrews in this Commonwealth: "I think the opinions of experts are not so highly regarded now as they formerly were, for while they often afford great aid in the determination of facts, itoften happens that experts can be found to testify to any theory however absurd." (Trial of Samuel M. Andrews, page 256.)

And in Palmer's case, Lord Campbell, in summing up to the jury, said: "With regard to the medical witnesses called on the part of the prisoner, I must observe, that although there were among them gentlemen of high honor, consummate integrity and profound scientific knowledge, who came here with a sincere wish to speak the truth, there were also gentlemen whose object was to procure an acquittal of the prisoner. It is, in my opinion, indispensable to the administration of justice that a witness should not be turned into an advocate, nor an advocate into a witness. You must say, gentlemen, whether some of those who were called for the prisoner belonged to the category I have described — that of a witness becoming an advocate." (Palmer's case reviewed in 1, Law Magazine and Review, page 332.)

Such opinions, expressed under such circumstances, frequently reiterated by lesser tribunals, provoke the inquiry, which perhaps may be difficult to satisfactorily answer, Where does the fault lie?

I take it, of course, that all comment of the kind which I have quoted, is directed rather to the method of receiving such evidence than to the nature of the evidence itself, for the severest critic would not hold that even under the prevailing law, and assuming that it cannot be improved upon, that opinion testimony, as such, should not be followed or relied upon.

If the physician were to be confined in his testimony to the bare narrative of the facts which he saw or observed, one at least of the safeguards of the community would be destroyed. The phenomena which result from the work of the murderer, the poisoner or the abortionist, as revealed in the human cadaver, are an enigma to the layman. Though accurately described, though no detail be omitted they mean but little to his mind. To the physician, the surgeon or the toxicologist they may demonstrate with entire certainty that death was not natural, that it was caused by violence or malpractice, or by the administration of poison; or with equal certainty, on the other hand, where guilt is suspected, suspicion to be unfounded. Such certainty, however, can find expression in our courts of law in but one way, viz.: by what is known as expert or opinion testimony.

It is useless, however, to attempt to palliate the contradictions, inconsistencies, exaggerated and absurd theories which under present conditions so frequently characterize the trial of the most important issues. It is seldom that a capital case is tried, which does not result in revelations of a nature which cannot but annoy and mortify the medical profession.

Few theories, however fantastic, need go unchampioned; the question of insanity has become a byword, and it is the experience of lawyers that to testify as an expert is becoming more and more repugnant to those physicians whose evidence would be of the most value. The annals of criminal jurisprudence of the century just past furnish too abundant proof of how strikingly medical experts have been at variance in particular cases; and of what diverse and inconsistent views have been entertained upon a given state of facts, by members of the same profession, and of equal eminence, educated, perhaps, in the same schools, contemporaries in practice.

The case of William Palmer, a surgeon, for example, who was tried in London for the murder by poison of one John Parsons Cook, is a most conspicuous instance of contradictions amongst experts. Four different theories were advanced by as many physicians as to the cause of death; the analysts called on one side and the other were wholly at variance as to the phenomena which attend the administration of strychnia.

In the case of Dr. Smethurst, tried a few years later in London, for poisoning a woman with whom he had contracted a sham marriage, the

conflict of evidence, medical and analytical, as to whether the symptoms of the post-mortem appearances were ambiguous and could be referred either to natural causes or to poison, was such, that though the prisoner was convicted, the public became so agitated, and the controversy carried on by letter and petition reached such a stage, that the home secretary, who investigated the matter remarked, in stating his reasons for recommending a pardon, "that the necessity for it did not arise from any defect in the constitution or proceedings of our criminal tribunals, but from the imperfection of medical science, and from fallibility of judgment in an obscure malady, even of skilful and experienced practitioners."

And we cannot but call to mind the case of Mrs. Maybrick, tried in 1889, the result of which has been so loudly denounced as a judicial error by some who are, but by so many who are not, familiar with the evidence. The direct conflict which arose at that trial between some of the ablest medical men of Great Britain as to whether Maybrick died of arsenical poisoning, or a natural death from gastro-enteritis, is quite fresh in our minds. Doubt existing, notwithstanding the verdict, the home secretary commuted the sentence, stating that "although the evidence leads clearly to a conclusion that the prisoner administered and attempted to administer arsenic to her husband with intent to murder, yet it does not wholly exclude a reasonable doubt whether his death was in fact caused by the administration of arsenic." And although the report of the trial discloses moral evidence against her of tremendous force, yet, I take it, the question of her guilt or innocence will continue, long hence, to agitate and distract.

But who will say that the conditions of which these cases are but illustrations are not largely owing rather to the defective method of the law, than to the imperfection of science, or that we are confronted with a state of things which it is impossible to ameliorate? Surely the fault cannot be laid at the door of science. Wherever the experts in the cases above referred to were in contradiction, one of them was right and the other wrong. The failure to find traces of strychnia in a dead body is either entirely consistent with, or entirely inconsistent with, its having been administered. The analyst in Palmer's case who maintained one of these propositions was telling the absolute truth and the other was testifying to what was entirely false. Science had a faithful spokesman in one, and a false spokesman in the other. Truth was struggling to express itself through one; error through the other. It would seem, then, that it is at least the duty of the law to establish as many barriers to the progress and triumph of this species of error as is humanly possible. Under the Common Law of England, in vogue in Massachusetts and most of the American States, what are those safeguards? Whoever

styles himself as a physician and who has some acquaintance with medicine, or who has had some practice, be it much or little, is regarded as competent to express his opinion as an expert, whatever may be his interest or bias.

To give an opinion as a medical expert, the law does not require that the witness should belong to any particular school of medicine. "The law has nothing to do with the merits of particular systems." (Corsi *vs.* Maretzek, 4 E. D. Smith, 1.) If the witness is a medical man and has the requisite knowledge, he may have acquired this knowledge either by study alone, although in practice he has observed no such case: State *vs.* Wood, 53 N. H., 484; Finnegan *vs.* Fall River Gas Works Co., 159 Mass., 311; or by practice alone: Mason *vs.* Fuller, 45 Vt., 29. He need not have made the subject a specialty in his practice. Nor to give an opinion as a medical expert, need the physician (except in Wisconsin where it is required by statute) be a graduate of a medical college, or even duly licensed: New Orleans R. Co. *vs.* Albertson, 38 Miss., 247. Nor need he be at the time in practice: Roberts *vs.* Johnson, 58 N. Y., 613; Tulles *vs.* Kidd, 12 Ala., 648; Everett *vs.* State, 62 Ga., 65. Nor need he have met a similar case in the course of his reading or practice: State *vs.* Clark, 12 Ind., 151. And finally, in some jurisdictions, it is not even essential that he should be a physician or should have studied for one, provided he has acquired the special knowledge required of the medical expert: Re Toomes, 54 Cal., 515; Dole *vs.* Johnson, 50 N. H., 452.

Insanity being deemed a disease, it is the general custom of our American judges to accept all educated and practising physicians as experts, whether they have given special attention to the disease of insanity or not. ("Bishop's Criminal Law," Section 544.) And it would even seem, from a dictum of one of our courts, that, in one State, at least, nurses, accustomed to attend upon the sick, are considered experts in respect to the mental capacity of sick persons. (Fairchild *vs.* Bascomb, 35 Vt., 298.)

In an Alabama case (an action for damages for false warranty in the sale of a female slave, a species of suit which was not uncommon in slavery times) a witness was permitted to give an opinion as to the soundness of the slave, whose qualifications were that previous to 1831 (the suit was brought in 1847) he had attended a course of medical lectures, had obtained a license from the Board of Physicians of the State to practise physic, and practised as a physician for one year when he abandoned medicine for the law, and for the period of sixteen years had been and still was following that profession, the witness stating that he had continued to read medical books, had kept up with the improvements of the science, and felt competent to express medical opinions

upon the diseases of women. It was stated by the court in its judgment "that the clinical practice is doubtless a most efficient mode of acquiring such knowledge, by enabling the practitioner from his own observation, to verify the assertions or theories of others, or to correct errors into which they may have fallen; and it may be, that medical opinions, not brought to this test are not worthy of much reliance as the basis of the verdict of a jury. But, if one asserts an ability to give correct opinions, upon any art or science from any acquaintance with the subject, acquired by observation and study, we cannot perceive on what ground he can be rejected because he has not been in the actual practice of his profession. This circumstance may deprive his testimony of much weight with the jury, but is no ground for excluding it."

In a late case which arose in Illinois, a physician who had practised thirty-four years, a graduate of a Chicago medical college, who, so far as appeared, had never in his practice witnessed a case of arsenical poisoning, was permitted to express his opinion that the deceased, under the circumstances shown, had died of arsenical poison. (Siebert *vs.* The People, 143 Ill., 571.)

These cases are fairly representative of the general trend of the decisions of the courts in this country upon the degree of qualification required of the medical expert. The question arises, then, whether the law has not lost sight of his true status; whether, permitting a party to call whomsoever he may find, having some general knowledge of medicine and willing to support a favorable theory, is not a departure from the true principles which underlie the admission of such testimony. There can be no mystery as to the real purpose for which experts are called. "What is their function?" says Professor Thayer in his "Treatise on Evidence." "It is just this, of judging facts and interpreting them. They are called in because, being men of skill, they can interpret phenomena which other men cannot, or cannot safely interpret. They 'judge' the phenomena, the appearances or facts which are presented to them, and testify to that which in truth these signify or really are; they estimate qualities and values. We say that they testify to opinion. In truth they are 'judging' something and testifying to their conclusion upon a matter of fact. For this reason, in Germany, experts are called *judices facti*—*judices* as opposed to ordinary witnesses, *judices facti* because they do not judge as to the law, but their judgment or opinion only gives as its result a fact." In this connection, it is interesting to note that when opinions were first admitted in the English courts as testimony (those which were offered earliest appeared to have been those of medical witnesses) they were received for the purpose of enlightening the court, and if they reached the jury at all did so through the medium of the court's charge.

In an appeal of mayhem tried in 1353, the justices having failed to determine from their own inspection whether a wound was mayhem, ordered skilled surgeons from London to inform the king and his court on this point.

An ejectment case tried in 1619 involved the question of the legitimacy of a posthumous child, and the court received the testimony of two doctors of physic in regard to the period of gestation, the record of the case reciting: "So the court delivered to the jury that the said Elizabeth, who was born 40 weeks and more after the death of the said Edmund Andrews, might well be the daughter of the said Edmund."

Sometimes the assistance of experts was obtained by the court without an open examination.

In 1703, Lord Holt, upon a question as to the negotiability of a promissory note, took occasion "To speak with two of the most famous merchants in London" as to their customs in regard to the endorsement of such paper. In an earlier case, at a trial for witchcraft in 1665, Dr. Thomas Browne, "a person of great knowledge," after viewing the accused was desired to give his opinion as to what he conceived of him, and he was clearly of opinion that the person was bewitched. (Trial of Witches, 6 How. St., Trans., 687, 697.[2])

It is difficult to perceive how an expert's position in respect to facts differs from that of a judge in respect to the law. The latter, upon all the facts, expresses his judgment as to the law in relation thereto; the former, upon some group of facts, expresses his judgment as to their significance and meaning so that the judge or jury, or whatever tribunal finally passes upon them may have a full understanding. In our law judges there are two requisites which every one is agreed are pre-eminent: learning and disinterestedness, and the faintest trace of prejudice, bias or partisanship disqualifies them. Neither little learning nor much bias, under our practice, disqualifies the expert.

We are zealous for learning and impartiality in our judges of law; why should we not be zealous for learning and impartiality in our judges of fact?

A mistake of law can always be cured by the revision of some appellate tribunal; a mistake in the opinion of the expert is often difficult to detect, and generally impossible to revise. The true status of the expert is entirely appreciated in those countries which inherited the Roman Law. In France and Germany, Italy and Austria, he is treated as a *judex facti*, a theory, which in Germany especially, is carried to its logical extreme. Whenever the man of science is there called on to express his judgment he is treated, not as an ordinary witness but as an assistant to the court, and accordingly is appointed by the court. The latter has

[2] For the early history of expert testimony under the English law see American and English Encyclopedia of Law. Second edition, vol. xii, p. 49.

the right to call experts at any stage of the case and of its own volition. It determines the number and exercises the selection of them. In but few cases the free action of the court in appointing experts is limited, where, for example, the law provides that in cases involving patents or copyrights, certain persons, *ex officio*, shall act as experts; and in civil cases the court is bound by the choice of both parties.

When the expert testifies he cannot be attacked like an ordinary witness; his veracity cannot be impeached because he is regarded as a part of the court and must be treated with like respect. The mode of questioning and the scope which the opinion may take are entirely discretionary with the judge and, in civil cases, at least, if the experts agree, the parties must accept their opinion as true, though not necessarily binding on the judge.

In America, the compulsory attendance of expert witnesses is of doubtful right and never exercised; in Germany and Austria whoever practices any profession or trade, or is authorized to do so, is obliged to act as an expert, when required, and the only reasons which will exempt him are those which would exempt from testifying as an ordinary witness. In Austria he swears to carefully follow the object of investigation, to truly and carefully state all his observations and findings, and his opinion according to his best knowledge, and upon his conscience, and according to the rules of his science and art. In Germany, he swears that he will give the opinion demanded of him impartially and upon his best knowledge, and upon his conscience.

The reasons assigned by German writers for so markedly differentiating the casual or ordinary witness from the expert, are principally, that the former is only a witness by chance while the latter is selected because of his standing and should not be subject to like criticism or attack; the ordinary witness is not the subject of choice and cannot be dispensed with; the expert testifies only through the choice or by the permission of the court; the casual witness at the time of the occurrence in question is frequently not impressed with the fact that he is to be called upon as a witness; whereas the expert makes his observations with that in view. The ordinary witness seldom testifies without bias for whatever we live through becomes a part of us and is affected more or less by our feelings and habits of thought and one's personality is apt to permeate his testimony; in the expert, because of his scientific training, the personal element is more likely to be eliminated. In fine, the conclusions of the casual witness are based upon his personal impressions while those of the expert rest upon scientific facts and laws. (Holtzendorff's Encyclopedia of Law, Vol. III, part 2, page 512.)

In criminal trials in Germany the medical witnesses first called to testify are those whom the State has assigned to the judicial courts after

previously ascertaining their knowledge in this department. The chief of the staff of professional experts is the district or town physician, the statutory regulations requiring him to be scientifically educated, properly licensed and skilled in all the three branches of medical science, medicine, surgery and obstetrics; while there is also an organized series of courts of professional experts to whose judgment the opinion of the medical men first employed may be referred. The law, however, does not exclude private physicians, and they are frequently called to testify along with the official physician and sometimes to his exclusion. (Casper's Forensic Medicine, Vol. III, page 178.)

It may not be uninteresting here to epitomize by a quotation from Casper the German practice in respect to the written reports of official experts, and its provisions for their revision: "A copy of all the medico-legal transactions of all the medical jurists in Prussia, both protocols and reports, without exception, is sent by each respective local magistracy to the provincial government, and through it, in quarterly budgets, to the Royal Medical College of the province, for its revision. The same procedure is followed in regard to all inquiries regarding lunacy or idiocy in civil law. This board, on its part, transmits their transactions, along with its remarks upon each, to the ministry appointed, in which both transactions and revisals are submitted to a super-revisal by its scientific commission, and the result is communicated both to the revising medical college and also to the medical jurists concerned, affording to the latter instruction or recognition and encouragement. "Here we have," says Casper, "no doubt, a cumbrous official apparatus set in motion, but this arrangement is indubitably successful in its operation, inasmuch, as not only does it maintain the central courts constantly acquainted with the doings of their medical jurists, but also indubitably has its share in the elevation of the practice of legal medicine in Prussia, to a perfection hitherto, attained in no other country, a fact which must be acknowledged, and which has quite recently been recognized by a most competent authority."

In Sections 173–177 of the Code of Criminal Procedure, which we have already quoted, the cases are described in which the reference of a medico-legal report to the superior courts shall take place. The rule, and the practice in most cases, is for this report to be sent, along with the other documentary evidence, first, to the medical college of the province, and should the opinion of this board be from any cause disputed, they are then sent to the Royal Scientific Commission for scientific affairs, to obtain its superarbitrium. This is, as in the medical colleges, drawn up by two referees, who work each for himself; both of their opinions are then brought before a meeting of the commission, discussed, and that one which is approved of by a majority of the commission is

accepted, signed and issued. A precisely similar sequence of professional courts is found in most of the German states. In some of the smaller ones, which possess no medical boards, the opinions of the medical jurists are sent, along with the documentary evidence, to some faculty, either at home or abroad.

One result of this legislation in Germany, which may seem to us too elaborate and perhaps artificial, is that the medical expert has at his command a series of written opinions and precedents of an authoritative nature, and embodying the best judgment of his profession. To the physician in forming his opinion, they must serve as useful a purpose as do the written judgments of the courts to the lawyer in forming his.

By sketching, perhaps at too much length, some of these features of foreign law, I would be misunderstood if I seemed to think it wise for us to model our own according to the same detail. The real keynote and underlying principle, however, of the law of Continental countries in this respect is that the expert should be the partisan of neither side; that he should be as dispassionate and just as one of our own Massachusetts judges; that in fact as well as in theory he should be the assistant of the court. That principle, if we are to hope that at some future time the medical expert shall enjoy all the respect and credence which it is his right and the right of science that he should enjoy, must be followed in some form or other. And if we are to reform our procedure in this regard, we must, I believe, finally seek relief from that source to which already the Common Law of England and of this country owe a debt which is difficult to measure, it must be sought in the body of the Roman jurisprudence.

THE UMILLIAN MURDER.[1]

BY HERBERT B. PERRY, M.D., AMHERST, MASS.,

Medical Examiner.

THE Umillian murder trial is said by those who are thoroughly conversant with such matters to be of peculiar interest because of the fact that more than three months elapsed from the time that the deed was committed before any actual evidence of crime was discovered, and of unusual interest because no direct evidence at any time was introduced as testimony into the trial. The murdered man's name was Casimer Jedrusick, the convicted murderer's name was Franciszeck Umillian. For ease in description I will refer to them as Jack, the victim, and Frank, the murderer.

On the 10th of April, 1900, I was summoned by State Officer McKay to go to Granby, not knowing what the case was except that a man's body had been found. I reached the farm of Monroe Keith, two and one-half miles from Granby Centre, about 9 P.M. and was informed that a man's body had been found in an old unused well. By the aid of a ladder I went into the well, which was about 30 feet in depth, and found the remains floating, that is a naked body except for a bran sack. The body was lying with the buttocks above the water, with the upper part of the trunk lying in a northwesterly direction. On going to the surface, I gave directions, and the body was brought up by the aid of a rope, and immediately taken to an old unused building near by where I performed an autopsy. The head had been severed from the trunk at the juncture of the second and third cervical vertebræ. The body was mangled and slashed and cut in all directions. First, a punctured wound just above the right clavicle 2 inches in length, another one parallel to it, over the head of the sternum, 2 inches in length. This was also a punctured wound. There was a vertical wound extending from the middle of the right clavicle, about 14 inches long, and ending 2½ inches above the umbilicus. There was a transverse wound about 12 inches long, beginning at the middle of the right clavicle, and ending at the middle of the left. On the right side a wound in the anterior axillary line, 7 inches in length, extending from the sixth to the twelfth rib on the right side. There were incised penetrating wounds on the right arm over the biceps muscle, 2 inches long. The left arm was

[1] Read before the Society, February 6, 1901.

crushed, lacerated and torn. A transverse wound over the anterior superior spine of the ileum, two incised wounds on the left thigh, 4 inches in length, and an oblique fracture at the juncture of the middle and upper third of the left femur. There were two incised wounds in the inside of the right thigh, one 7 inches in length, and one 4 inches in length. The ribs on the left side, from the first to the ninth, inclusive, were crushed and broken. The sternum was broken and four ribs fractured on the right side. The heart and pericardium were absent, the large vessels being partially torn and partially cut. The stomach was empty except about a pint of a pultaceous mass. The intestines were normal, uninjured except a small wound in the ileum. The lower lobe of the left lung was lacerated and torn, the right pleural cavity had been opened. The lung was collapsed but was unwounded. The body was identified positively by a deformity of the index finger of the left hand. Evidently there had been a felon sometime and the distal phalanx was atrophied and bent inward toward the median line. Another means of identification were some enormous bunions on the great toes of both feet. After the body was taken to the surface and the discovery made that the head had been severed from the body, further search was made in the well with the hope and expectation of finding the missing head. It was not found, however, but we did find the clothing which was identified as belonging to Jack. This was delivered to one of the officers.

On the 12th of April, two days after the body was found in the well, the head was found buried in the soft earth of the barn cellar of Mr. Keith and delivered to me about six o'clock of the same day. The soft parts, including the brain, were totally destroyed, so much so that an attempt at differentiating one part from another was absolutely impossible. After a careful preparation of the skull, the wounds in the bony parts were as follows: I will speak of these numerically in the order in which they seem to me to have been inflicted. First, was a wound beginning ¼ of an inch posterior to the coronal suture and 1¼ inch external to the saggital suture on the left side. This wound was 1⅞ inches in length, wider at the middle portion, being ⅝ inch in its widest diameter. The second wound was 2½ inches long, beginning at the inferior temporal ridge, extending downward and slightly backward from the squamous portion of the temporal bone, destroying the styloid process of the petrous portion of the temporal bone, and extending through and dividing the pterygoid process of the sphenoid bone. The third wound was 3 inches in length, 1¼ inches from the median line over the right occipital. This wound extends backward toward the right side. The fourth wound, 1 inch in length, and 1¼ inches from the median line and parallel to it, and 1 inch internal and behind the mastoid process. The nasal, the right malar, right zygoma, lachrymal and the anterior portion

of the right wing of the sphenoid were separated from the adjoining parts and absent. The right lachrymal and superior maxillary were absent. The larger half of the frontal and squamous portion of the temporal and the left wing of the sphenoid were separated except for attachment of soft parts. The inferior maxillary bone divided in the medial line, the right half absent.

Now it will be particularly interesting to endeavor to weave a theory as to just how and in what manner these blows were delivered, the circumstances and the motives for such extensive mutilation and laceration. Taking first the blows on the head, as I have already said, I have numbered the wounds, one, two, three, four, according to the order in which they seemed to me to have been inflicted. The last time Jack was seen alive was on the 31st of December, 1899, Sunday morning, shortly after 10 o'clock, by his employer, Mr. Keith, to whom he had brought a horse and carriage that Mr. and Mrs. Keith might attend church at Granby. Jack, after leaving them, went directly into the horse barn with the intention of changing his clothing and shoes and going to Granby. He sat down on a bench near where the men were in the habit of keeping their footwear, stooped down to untie his shoes. Frank came in at this time, saw Jack and in a paroxysm of long pent-up rage and fury, seized a corn-knife (which is an instrument used for cutting corn, having a blade about 2 inches in width and 18 inches in length attached to a stout oak handle) from one of three which were hanging on a beam near by. He was standing somewhat behind and to the left side of Jack as he was stooping over fixing his shoes. That was the first blow that was struck, a crushing downward sweep of a sharp instrument penetrating the skull, and driven well into the base of the brain. From the blow and the shock Jack pitched forward. Frank sprang over the prostrate body and struck again, the point of the corncutter entering the skull just at the petrous portion of the temporal, crushing through the squamous portion of the temporal bone. As the body of the now unconscious Jack writhed on the floor in death agony, other blows were rained thick and fast on the unfortunate man until death put an end to the struggle. Frank then, with speed and keenness born of desperation, opened the trapdoor in the horse barn, dropped the body, clothing and all, down into the soft, muddy, foul bottom of the cellar. To bear out this theory, let me say here that on the clothing taken from the well was found soil from the barn cellar, and inasmuch as all of the ground outside of the barn cellar was frozen hard at this time, only from the barn cellar could this mud and filth have come. Frank closed the trapdoor, then went a roundabout way into the cellar and then began the mutilation of the body that has already been described. His first thought was to destroy as far as possible all means of identification. So he hacked and cut and

slashed the face until all resemblance to features was gone. Then what must be done with the body. He severs the head from the body and attempts to further cut the body up to facilitate the disposition of it. Finding it a rather difficult task, he stripped the body of its clothing, thrust it into a sack, secreting it until some time that night or next morning, then taking it, with the clothing in another sack, carrying it across the road about 150 yards, and dropping it all in the old well, having previously secured a large stone from a nearby wall, which he put in the sack with the clothing to sink it. Before an examination of the clothing had been made, I was asked the question if the mutilation of the body was done before or after the clothing was removed. My opinion was that most of it was done after the clothing was removed, basing my opinion on the length of the wounds and the peculiar characteristic appearance of an incised wound, believing it to be impossible to inflict a cut like any of these through the thick winter clothing. The examination of the clothing proved my theory correct, for in it were found only two cuts, the ones corresponding to the punctured wounds over the right clavicle and over the sternum. An attempt was made to demonstrate the presence of blood on the floor and on the corncutter, but Professor Wood, of Harvard, was unable to find any traces. This result was what might have been expected, because over the floor where this tragedy is supposed to have taken place the constant tramping aud use of three months would obliterate practically any bloodstains. The rusty corn-knives would, in three months, undergo such oxidation and change from atmospheric influence, that Professor Wood gave as his opinion that if it had been there it would be a practical impossibility to demonstrate it after three months had elapsed.

There is one point of particular interest to me, because as far as I am able to determine or ascertain, nothing of the kind has ever been observed. After the autopsy and search in the well for the missing head, thoroughly chilled and tired, I went to the house of Mr. Keith, into the kitchen where Frank was sitting hand-cuffed to the officer. It being my first actual experience with a real live murderer, I was particularly curious to note his actions and to see if he had the appearance of a guilty man. While sitting there, there occurred to me suddenly a plan which had been brought out in some of the French courts, that is, the sudden accusation and startling evidence suddenly presented to the suspected criminal, noting the effect on the heart's action through the nerve centres. Frank was sitting with his knees crossed and I was able to determine approximately his pulse rate, which I counted several times, and was able to count it at about eighty beats to the minute. After a short time Mr. McKay, the district police officer, came in, sat down and said, "Frank, where is that head? What did you do with it? Did you

bury it in the barn cellar?" The man made no response except "I don't know," but his pulse rate increased until I was able to count about 120 beats per minute. I was satisfied, then, in my own mind that the man knew much more about it than he was willing to reveal. The subsequent finding of the head in the cellar certainly seemed as though he did know something about it.

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UPON WHAT SORT OF INFORMATION SHALL A MEDICAL EXAMINER HOLD A VIEW?[1]

BY H. M. CUTTS, M.D., BROOKLINE, MASS.

Medical Examiner.

MR. PRESIDENT AND FELLOWS: — The title of my paper is, as you see, a question. I do not, therefore, come before you to impart any knowledge, but rather to provoke discussion, and decision, if possible, upon a moot point in medico-legal procedure.

I am aware that the subject in the title has been several times discussed before this society, but I have discovered that there exists a difference in practice among my brother examiners as to the method of procedure upon the point which my case illustrates, namely, upon the sort of information which made me cognizant that the body of a person whose death was "supposed to be due to violence," lay within my district.

The case is as follows: F. K., while aiming to board an electric car for Boston, passed in front of an outward bound electric, and was struck on the head by the latter, causing a compound comminuted fracture of the skull, from the effects of which he died, or presumably died, for a trephining operation was done before death.

This event occurred on the morning of March 16, 1900; F. K. died early in the morning of the next day without regaining consciousness.

I was told of the accident shortly after its occurrence by a man who was on one of the electric cars, but as he reported that F. K. was not dead when picked up and removed to a nearby house, I, of course, had nothing to do.

I heard of F. K.'s death some hours after it had actually taken place on the 17th, but merely as a rumor that such was the fact. No notice of the death came to me from the police, none from the attending physician, and none from the undertaker. I will say that the police, like myself, had only the rumor; the attending physician was unaware that any legal procedure was even remotely to be considered, and I suppose that the undertaker minded his own business.

There are two points of interest in the circumstances as related: (1) I was aware on creditable information that the body of a person

[1] Read before the Society, February 6, 1901.

supposed to be dead by violence lay within my district, and (2) that he had supposedly been killed by "an accident upon a railroad."

You will remember that the inquest law requires an inquest upon a person killed by "an accident upon a railroad," and in my digest of the law I had interpreted the word "railroad" to be a generic term which covers steam railroads, street railways, and will, if the kind comes within my reach, cover "elevated" railways.

I say, therefore, that I was in a quandary. It was my first experience with a death "supposed to be due to violence" in which I had not received a "notice" sufficiently straightforward to cause me to take action. Yet I was convinced that I was specifically instructed by the law to hold an inquest in deaths after such a manner as this. It is natural that when in doubt one should turn to some one of greater experience than oneself, to call a consultation, so to speak, so I telephoned Dr. Draper of Boston, and stated the case as above. Dr. Draper informed me that it was his custom to consider deaths upon the street railways as coming under the law requiring inquests, but that it was no part of a medical examiner's business to hunt around after the evidences of a death whose announcement had not come squarely to his ears.

With the first part of the reply I entirely agreed, but with the second part I confess I was not satisfied. However, I acted upon it as a whole and did nothing. The sequence was that having been called by the undertaker on the 19th, two days after the death, to sign a certificate for cremation, I learned the "cause and manner" of the death, and called an inquest in accordance with the practice in Boston and my own preconceived ideas of propriety.

In looking back over the *Transactions* of this society, I find that our subject has been but seldom touched upon. Certainly nothing on record from the lips of a medical examiner defines any rule to govern in the premises, if perchance any rule can govern. I have quoted to you the opinion of Dr. Draper, and I now quote to you the opinion of an officer of the law.

District Attorney Asa French, in a paper entitled "The Duties of a Medical Examiner Considered in their Practical Relations," read before this society June 10, 1879, says (Vol. I, No. 2): "What constitutes a notice to the first inquiry? I answer, any reliable information of the fact. The notice need not be a formal one; whenever and however the medical examiner becomes aware that a dead body has been found under circumstances of suspicion, his duty is to attend and take charge of it without delay."

This is a pretty clear definition of the sort of information which should set a medical examiner to work investigating, but unfortunately

the words "under circumstances of suspicion" are somewhat ambiguous. These words materially limit the definition's scope, unless we conclude them to be synonymous with "supposed to have come to his death by violence." I am forced to believe that Mr. French's words were meant to be synonymous with the last clause quoted, because it seems to me to be their safest interpretation for guidance in the future. For instance, there was no suspicion of foul play in my case, but there was a very strong, in fact positive, opinion among the friends of the deceased that the death was in no way due to any fault of F. K.'s.

Now, unquestionably, it is just as much our duty to establish innocence as guilt, but if doubt, which cannot be swept away by view and autopsy exists, as to some one's negligent or criminal act, neither innocence nor guilt can be determined without an inquest. Mr. French's words, "under circumstances of suspicion," would give me just as much *reason* to act as the words "supposed, etc.," for there was certainly a "suspicion" that the motorman on the outward car was at least negligent, in fact this was the finding of the judge after the inquest.

Other quotations more or less to the point may be cited. In a discussion of a paper by Dr. Mead (June 12, 1894, Vol. II, No. 5), Dr. Munsell quotes a letter from District Attorney George Marston, who says, "You had better make ninety-nine uncalled for views than let the one-hundredth go by." We may draw something from this by inference.

Attorney-General Knowlton, in a paper read before this society February 3, 1897 (Vol. II, No. 7), is clear enough in his definition as to who has a right to "suppose" that a death is by "violence." He says: "Who is to make the supposition? I answer, anybody, anybody." Would that he were as clear a little further on when he says: "I am told that there is some hesitation on the part of some of your body as to how far they should proceed upon rumors; . . . no one can lay down rules; the medical examiner must not be influenced by considerations of the county treasury, or by objections of county officers against the expense, but by considerations which are founded upon his own good sense and experience"!

All agree that the medical examiner may be in doubt at times and in cases. I believe that our guild will agree that rules by which to make up one's mind as to the exact procedure in all cases cannot be laid down. Fortunately, all medico-legal authorities are in accord that we should act for the best interests of the Commonwealth, and they define the best interests of the Commonwealth to be, to quote the words of Dr. Amory, "to err in cases of doubt upon the side of too much rather than too little investigation." (Oct. 5, 1881, Vol. I, No. 4.)

APPENDIX.

MEMBERS OF THE SOCIETY, 1901.

REGULAR MEMBERS.

Z. B. ADAMS, M.D., Framingham.
C. A. ATWOOD, M.D., Taunton.
F. S. ATWOOD, M.D., Salem.
F. H. BAKER, M.D., Worcester.
H. G. BLAKE, M.D., Woburn.
F. A. BRAGG, M.D., Foxborough.
T. F. BRECK, M.D., Springfield.
O. J. BROWN, M.D., North Adams.
A. W. BUCK, M.D., Fall River.
HOMER BUSHNELL, M.D., North Adams.
F. J. CANEDY, M.D., Shelburne Falls.
C. A. CARLTON, M.D., Salem.
HENRY COLT, M.D., Pittsfield.
J. F. CROSTON, M.D., Haverhill.
H. M. CUTTS, M.D., Brookline.
F. W. DRAPER, M.D., Boston.
H. W. DUDLEY, M.D., Abington.
T. M. DURELL, M.D., Somerville.
E. W. DWIGHT, M.D., Boston.
R. H. FAUNCE, M.D., Sandwich.
H. K. FOSTER, M.D., Peabody.
J. C. FRASER, M.D., East Weymouth.
J. C. GALLISON, M.D., Franklin.
J. K. GIFFORD, M.D., Fall River.
J. J. GOODWIN, M.D., Clinton.
F. A. HARRIS, M.D., Boston.
B. H. HARTWELL, M.D., Ayer.
E. D. HILL, M.D., Plymouth.
A. H. HODGDON, M.D., Dedham.
E. G. HOITT, M.D., Marlboro.
C. C. HOLCOMBE, M.D., Lee.
C. S. HOLDEN, M.D., Attleboro.
F. HOLYOKE, M.D., Holyoke.
G. DE N. HOUGH, M.D., New Bedford.
O. M. HOWE, M.D., Cohasset.
J. C. IRISH, M.D., Lowell.
E. S. JACK, M.D., Melrose.
F. E. JONES, M.D., Quincy.
H. B. MCINTOSH, M.D., Medway.
J. A. MEAD, M.D., Watertown.
W. W. MINER, M.D., Ware.
W. M. MOORE, M.D., Provincetown.
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THE ERICKSON MURDER.

BY F. H. BAKER, M.D., WORCESTER, MASS.,
Medical Examiner.

I REPORT this case before the society, as this murder and the subsequent trial present several interesting legal and medical phases; namely:

(1) Murder was not committed with premeditation, but when the assailant was in the act of robbing a house at night.

(2) The prompt arrest of the murderer in a neighboring town on a rather meagre personal description.

(3) The finding of blood upon the shoes and clothes worn by the accused.

(4) Trial and conviction of murder in the second degree in less than four months after the tragedy, the evidence being chiefly of a circumstantial nature, as no one identified the prisoner in the house where the murder was committed.

At 2.30 A.M., Nov. 10, 1900, I was notified that a murder had been committed at No. 10 Catherine Street. Upon my arrival I found the body of Gustaf A. Erickson lying upon the kitchen floor in the top tenement of a three-story house. There were then present: Mrs. Erickson, three police officers, the ambulance surgeon, driver, and two men from the middle tenement.

It is unfortunate, in a case of this character, for the first police officer who arrives upon the scene to allow anyone to enter until the arrival of the medical examiner, for it is plainly evident that valuable evidence may thus be lost.

I found the body dressed in a thick undershirt and drawers, lying upon the back, with the head pointing toward the back door of the kitchen. His arms were slightly bent at the elbows and lay at his sides, his legs were nearly parallel, and his right foot was under the edge of the kitchen stove. The undershirt and drawers, especially the former, were extensively soaked with fresh blood. Around the body on the floor were several large, irregular pools of blood, and on the right side of a double bed in a small room off the kitchen was a large pool of blood, with many spatters over the bed-clothing, especially on that side. There were numerous traces of blood on the floor, between the right side of the

[1] Read before the Massachusetts Medico-Legal Society, June 11, 1901.

bed and the wall, and spatters over the adjacent paper and woodwork, also on the floor, from the right lower corner of the bed to where the body was found.

Those present, chiefly Mrs. Erickson, had tracked the blood around the kitchen to a slight extent, and there were a few blood tracks on the back stairs, down which Mrs. Erickson had gone after the stabbing.

There were evidences of robbery, for on the kitchen floor lay an open pocketbook, and an overcoat folded once lay on the floor of the front room, near the hall door.

An examination of the body showed it to be still warm. I found a clean-edged, vertical incised wound, $\frac{3}{4}$ of an inch in length and gaping at its middle $\frac{1}{8}$ of an inch, with its lower end situated $1\frac{3}{4}$ inches above the level of the left nipple, and 1 inch to the left of the median line. There was no bruising of the skin around this wound. In the undershirt was a clean cut, corresponding in shape, size and position with the wound in the chest.

The clothing which the man wore, and the bed-clothing and pieces of woodwork, were turned over to the chief of police for evidence at the trial, and the body was removed in the police ambulance to the City Hospital morgue, where I performed an autopsy at 9 A.M., Nov. 10.

The body was that of a well-developed, muscular man, a Swede, 5 feet, 8 inches in height, and estimated to weigh 165 pounds. The surface of the body was pale, and rigor mortis was beginning throughout the body.

An interesting fact in the stab wound was, that it was $\frac{1}{8}$ of an inch shorter at this time than at the time the body was first viewed, with the relative increase in the gaping of the wound. The only other marks of violence upon the body were several linear abrasions on the back of the right elbow-joint, probably caused by falling.

The stab wound in the chest passed directly backward, and penetrated the pulmonary artery in the middle of its anterior surface, making a clean-edged cut, $\frac{3}{4}$ of an inch in length, with its lower end $\frac{1}{2}$ inch above the pulmonary valve, but it did not pass through the artery or nick the posterior wall.

There were 2 or 3 ounces of fluid blood in the right pleural cavity, and 4 to 6 ounces in the pericardium, but none in the left pleural cavity, on account of old adhesions, which obliterated the cavity and bound the lung to the pericardium and to the chest wall.

The brain and all other organs of the body, except as otherwise stated, were in an apparently normal condition, except for the anemia resulting from the severe hemorrhage. The stomach contained about 5 ounces of a dark, thick, viscid fluid, in which were a few pieces of potato, with no odor of alcohol.

I questioned the murdered man's wife, who was greatly excited, and she stated that both she and her husband had gone to bed about 7 o'clock, and that he slept on the inside of the bed, next to the wall; that previous to his going to bed he had been carving a box, and had left the knife upon the kitchen table. It was their custom to leave a lamp burning low in the kitchen, which they did that night. About 2 A.M. the husband waked and said: "What is it?" and a man reached over her and stabbed her husband once. Her husband jumped up, walked into the kitchen, and died in a "minute or two." His assailant ran out of the kitchen. She went down the back stairs crying out, and notified the tenants. She furthermore stated that the overcoat was hanging in the closet at the head of the bed when they retired, and that the pocket-book found on the kitchen floor had been in a pocket of the trousers which lay on a lounge at the foot of the bed.

The knife with which he had been working in the evening, and which had been on the kitchen table, was missing, but was found the following morning in the front yard. It was an ordinary shoe knife, with a blade much worn down, being $\frac{3}{8}$ of an inch in width and $2\frac{5}{8}$ inches in length, with a handle $3\frac{3}{4}$ inches in length. There were evident blood stains upon the blade of the knife.

Mrs. Erickson could not identify the assailant, but a woman and her two sons, living in the lower tenement, heard Mrs. Erickson's screams, and on opening their hall door saw a short, thick-set man open the front door and run out. They did not see his face, but did see that he wore a brown derby hat and a dark suit, and this fact was of much importance. During that morning Mrs. Erickson was arrested as a suspected accomplice, for it was found that she had not lived happily with her husband, and that she had given birth to an illegitimate child by another man before her marriage.

The police immediately started in to find this man. They obtained from two railroad employees a description of a Swede, a short, thick-set man, who had appeared in the freight yards about one hour and one-half after the murder had been committed; who had made several inquiries; and this description corresponded with that of a man who had been inquiring in two different parts of the city, the day before, for a man whose name he did not know, but who lived "on a hill behind a schoolhouse," and who had been directed to the neighborhood where the murder occurred. These descriptions were at once telegraphed in every direction, and on Sunday night, 40 hours after the murder occurred, the man was arrested by the chief of police of Clinton, Mass., at Clinton. He was then found to be not the former lover of Mrs. Erickson, whom they thought they were tracing, but an entirely different man, Oscar Nelson. The former lover was traced and was

found to be married and living in a neighboring town. His whereabouts at the time of the murder were satisfactorily accounted for, and Mrs. Erickson was discharged in the lower court.

Nelson was indicted by the Grand Jury at the January term for murder. His trial began Feb. 25, and lasted one week, and the following interesting chain of circumstantial evidence was introduced against him, mainly through the intelligent industry of Chief of Police Stone of Worcester:

Two days before the murder Nelson left the farm in Palmer, where he had been working, and came to Worcester. He there met several Swedes, until that time unknown to him, and spent the day drinking with them, and the night at the house of one of them. He drank the following day and visited several saloons. At half-past nine he went to the same house, where he spent the preceding night, and wanted to stop there. He was refused admission, as all of his drinking companions were afraid of him, on account of the stories he told of the deeds he had done. After this he inquired where the "tall Gottlander" lived, meaning one of his drinking companions. He was told that this man lived in the second house around the corner, on the top floor. This direction was wrong, as his acquaintance lived in the third house. Unfortunately, Erickson, who was wholly unacquainted with Nelson, lived in the second house, and it happened that on that night the lower door and the door of his own tenement were unlocked.

The government theory is, that Nelson entered the apartment, expecting to see his acquaintance of the day before, but, finding no one awake, as his money was all gone, Nelson determined to rob the house, first taking the knife, which lay upon the kitchen table, to be used if necessary. While in the act of robbery, Erickson awoke and cried out, and Nelson immediately stabbed him. Then, after a short delay, Nelson went through the kitchen and down the stairs, where he was seen by the people on the lower floor, but who did not see his face so as to identify him. In fact, no one saw him enter the house, or while he was in it, or as he was leaving it. He was not accounted for between the hours of 9.30 in the evening and 3.30 in the morning.

He did not go to the house next to Erickson, where he was directed at 9.30. The first trace of him, aside from a man's hearing steps running down a nearby street a little after the murder, was one and one-half hours later, when he was seen and positively identified in the freight yards. Later, he was seen in Sterling the following morning, and then in Clinton, where he stopped at a house and asked for blacking. They had none, but he obtained a brush and rubbed his shoes. A little later he stopped at another house and blacked his shoes, and did it again about an hour later at another house. He visited a Swedish family

there, and they referred him to another family for information, which he desired. Again he mistook the house,— this time a serious thing for himself, as, instead of calling on the Swedish family, he stopped at the house of the chief of police, which was next door to where he wished to go. When the chief of police of Clinton found that a Swede had been at his house making inquiries, he noticed the similarity to the description of the man wanted, and in a short time had him under arrest.

Nelson's shoes and clothing were sent to Prof. E. S. Wood, together with a piece of woodwork, and in spite of the blacking which the shoes had received, and in spite of the fact that they had been worn several days, he found blood spatters upon them, and blood which was consistent with that found in a human being.

At the trial the accused did not take the stand in his own defence, and no alibi was attempted. The defence maintained that Mrs. Erickson and some man were the guilty parties. It was known at the time of the trial that Nelson had served two terms in state prison for robbery, but of course this could not be introduced in the evidence, but may have been the reason for Nelson's not taking the stand. The jury, after a moderate deliberation, returned the verdict of murder in the second degree, and he was given life sentence.

ON THE ESTABLISHMENT OF MEDICO-LEGAL DIPLOMAS.[1]

BY WYATT JOHNSTON, M.D., MONTREAL, CAN.

THE points I wish to discuss are:
Is there a need for such diplomas?
What should be the standard adopted?
How can the teaching be provided for?
How is the diploma to be recognized?

I. NECESSITY FOR MEDICO-LEGAL DIPLOMAS.

The selection of medico-legal experts may be arrived at in three ways: First, *partisan selection*, or leaving the choice to the litigants. This has the inevitable result of a conflict of opinion, and has led, in America and elsewhere, to the development of a class of men whose ingenious, though perverted, ideas of medico-legal matters have had a maximum tendency to bring the subject of medico-legal expert work into general disrepute, with a minimum amount of compensating benefits in the way of addition to our scientific knowledge.

The second plan, or *arbitrary selection* by the judicial or state authorities, which has been followed until recently in France, and is being constantly advocated with us as a panacea for the existing evils in connection with medico-legal testimony. This plan has the great advantage of developing a number of skilled officials, to whom as a class we owe most of our recent progress in medico-legal knowledge. The drawbacks are: That it is only applicable under specially favorable conditions, as regards the constitution of courts in regard to stability and freedom from bias; also it has a tendency to limit the rights of litigants, beyond what is consistent with our legal traditions and usage. In France this method has proved so defective, owing to the egregious blunders of individual experts, that its abandonment has been recently decreed by the Cruppi Law, regulating the appointment of official experts for the defense in criminal cases.[2]

The third plan, that of *selection by special qualification*, has been successfully followed for the last fifty years in Germany and Austria, and has now been introduced into France by the establishment of a post-graduate diploma course in legal medicine. It is difficult to see how any system of selection of medico-legal experts can be successful,

[1] Read before the Massachusetts Medico-Legal Society, June 11, 1901.
[2] Semaine Méd., July 5, 1899.

unless some adequate, defined and reasonable standard of technical training be established. This has the advantage (1) of ensuring that all who receive appointment as experts will have had suitable preparation; (2) of permitting the individual selection by state and judicial authorities from among these; (3) of affording a means whereby any one desiring to take up such work can show that he possesses the necessary training; and (4) of protecting properly qualified persons from the competition and rivalry of the unqualified.

Thus the establishment of medico-legal diplomas would appear to be the first step in any scheme for reforming expert testimony, whatever the particular methods followed in making appointments.

II. STANDARD OF MEDICO-LEGAL DIPLOMAS.

Under the German system, the required qualification for official medico-legal work is the passing of the *physikats-examen* subsequent to graduation and licensing. The amount of special study required is about six months, and the standard demands fitness for the performance of official public health, as well as medico-legal work, the appointees, as official government physicians in small centres of population, being entrusted with both kinds. This is inapplicable where (as with us) the public sanitation and medico-legal matters are under separate and independent control, and it has not been found in any case that the exaction of the double qualification in State Medicine has much in its favor, as the sanitary districts are as a rule much smaller than the medico-legal ones.

The best standard for general adoption in medico-legal diplomas is that recommended by Professor Brouardel, in 1884, for adoption in France, but only accepted in 1900, and which is fully explained in the published report by Professor Brouardel.[3]

The qualification demands a full academic year (nine months) post-graduate study in legal medicine, including practical autopsy work, elementary toxicology, study of nervous diseases, medico-legal methods in examination of stains, questions of sex, etc., and a knowledge of medical law and responsibility. Courses in legal medicine are not compulsory for medical students in France or Germany, whereas most of our teaching bodies go to the opposite extreme — of supposing that all medical students are qualified for the work on graduation, by the too often very inadequate courses in legal medicine provided for in the ordinary medical curriculum.

[3] Bulletin of the Paris Faculty of Medicine, February, 1900; and Annales d'Hygiene Publique, Nov. 11, 1884.

In arranging (jointly with Prof. George Wilkins of Montreal) the schedule for the medico-legal diploma[4] which was adopted by the Medical Faculty of McGill University in November, 1900, we followed the requirements of the Paris diploma as regards the scope of the course and length of study required. We selected, however, the model followed in the British diploma of public health, of demanding at least six months' practical training as assistant in medico-legal work, of all candidates, a precaution which seems very necessary. We also included among the requirements a practical training in the medico-legal study of disability after injury. This branch of legal medicine I consider to be really more necessary to the ordinary medical student than the medico-legal autopsy training which he usually receives, since the majority of practitioners will rarely, possible never, have to make medico-legal autopsies in their practice, whereas in each year they will almost certainly have on several occasions to examine or testify in reference to personal cases.

The amount of instruction provided for on toxicology and mental diseases is intended rather to qualify the expert to co-operate intelligently with a skilled analyst or alienist, than to undertake the work independently. For independent work in either of these branches, at least a year's additional special study and practice as assistant would be needed.

One of the difficult problems to settle is that of establishing a standard of special training in pathology, to qualify as a specialist in medico-legal autopsy work. It would seem that we have the choice of training either a type of medico-legal specialist in one line of work, or a type of all-round medico-legal practitioner, and the question of deciding what

[4] Candidates for the diploma must possess a degree in medicine, or other qualification for practice, and present certificates of having attended the following courses: (1) A course of six months' scientific study in legal medicine, consisting of systematic lectures and practical medico-legal instruction in laboratories and elsewhere. (2) A course of six months' training as assistant in medico-legal practice. The candidate shall produce a certificate, or certificates, satisfactory to the faculty, that he has continuously and actively assisted in the regular duties of some medico-legal expert recognized by the faculty. Of the two six-months' courses referred to in this and the preceding paragraph, not more than three months shall be concurrent. (3) A special course, or courses, of lectures in legal medicine and mental diseases. (4) A practical (laboratory) course in toxicology. (5) A course of instruction in the law relating to medicine, and to the status, rights and responsibilities of the physician. (6) A series of short courses, with demonstrations upon the following subjects: (*a*) methods of conducting medico-legal autopsies; (*b*) the methods of medico-legal microscopy; procedure in the examination of blood stains, etc.; (*c*) methods of skiagraphy; (*d*) methods of procedure in cases of wounds and injuries; (*e*) method of procedure in cases of assaults upon women and children; (*f*) methods of procedure in cases of abortion and infanticide; (*g*) methods of procedure in cases of the determination of sex and paternity; (*h*) methods of procedure in cases of offence against morals; (*j*) methods of procedure in the study of mental conditions; (*k*) methods of procedure in examination for life and accident assurance; (*l*) estimation of compensation for injury. No candidate shall be admitted to any portion of the examination for this diploma until at least one full academic year has elapsed since his graduation in medicine.

[5] Prof. F. W. Draper of Harvard has for years included instruction in this branch in his course to medical students, the work being in charge of Dr. Dwight.

options of study are permissible, after the general work is covered, is a new one. The exaction of a year's additional study for the medico-legal specialist seems to be a reasonable minimum.

III. ARRANGEMENTS FOR GIVING COURSE.

Most medical schools have the means of giving the necessary instructions, provided that, by co-operation with the courts, sufficient access to material can be had. It will be found as a rule that an offer to give free instruction to official nominees, in return for the privilege of utilizing the material for instruction, will be effective. It is very desirable that the practice followed in Germany, by which those who have received official appointments return at intervals of three years for a three-months' supplementary course of instruction at government expense, should be introduced. The plan of giving medico-legal clinics on groups of selected cases makes an interesting method of teaching, and the pupils have a chance of studying the cases independently. Enough suitable cases usually occur in the routine material of large hospitals.

It is a relatively simple matter to secure among the teaching staff some who are specially interested in legal medicine, and who have special knowledge of neurology, chemistry, obstetrics, and other topics, on which strict practical courses have to be given. One often wonders why our numerous post-graduate schools and polyclinics have not established a high standard of post-graduate instruction with rigorous examinations. They would probably find the hospital and other authorities ready to support them by exacting such qualifications in making appointments.[6] Our post-graduate instructors, being free from the burden of under-graduate teaching, might be fairly expected to make a better showing in this direction than is actually the case. The time must be past when a simple degree or license adequately guarantees fitness for all medical positions.

IV. RECOGNITION OF THE DIPLOMA.

While it is hardly to be expected that the State authorities would be at once disposed to recognize officially the possession of a diploma as indispensable for all medico-legal experts, yet the influence of recognition by medical societies, medico-legal societies, bar associations and the bench, would in itself probably be sufficient to make the qualification worth obtaining by those engaged in medico-legal work. The want of any such qualification would also tell somewhat against the amateur expert.

It would thus appear that, pending general official recognition, those engaged in medico-legal work would be aided by the establishment of medico-legal diplomas.

[6] In London the higher qualifications of F.R.C.S. and M.R.C.P. are prerequisite in all candidates for appointment on the attending staff of any first-class hospital.

MEDICO-LEGAL EXAMINATION OF BLOOD STAINS.[1]

BY EDWARD S. WOOD, M.D., BOSTON,

Professor of Chemistry in the Harvard Medical School.

I REGRET that I have not been able to prepare a carefully written paper upon this subject. I shall not attempt to treat it exhaustively, but shall endeavor to limit my remarks to some of the more practical points in connection with the medico-legal examination of blood stains.

In the first place a great many different substances and a great many different kinds of stains are submitted for medico-legal examination. We may have stains which are pure blood stains, or we may have stains which contain blood mixed with other substances. They may contain chiefly pure blood, mixed with a small quantity of other substances, or they may consist chiefly of some foreign material, mixed with a little blood; good illustrations of these stains are nasal and menstrual stains. In both cases, when the hemorrhage is abundant, the stain may consist of pure blood with no mucus or cells mixed with it. On the other hand, with a nasal blood stain, if the hemorrhage is very slight, the stain may consist chiefly of mucus and colored more or less with blood, and in the case of menstrual stains, at the beginning and end of the flow particularly, the stain may consist chiefly of vaginal cells and secretion with very little blood, and if there happens to be a leucorrheal discharge, the stains may contain a good deal of pus.

We also have submitted for examination, stains which are called washed stains, caused by an attempt to wash out the blood from a stain with water. This is usually ineffective. It is, of course, possible to thoroughly remove a blood stain from cloth by washing, but in most cases which require medico-legal investigation, the washing is more or less imperfectly done. Blood stains on white cloth, when subjected to the action of water, have a very peculiar appearance; the pigment is carried along by the water over the surface of the cloth, and deposited in a thicker layer upon the edge of the wet space than it is in the centre. When a blood stain has been sufficiently exposed to the action of water, the red blood cells are altered in their form, size and composition, and in such a stain we can only determine the blood pigments, but have no means of determining the nature of the stain, whether the blood comes from a human being or from some animal. It often happens also that

[1] Read before the Massachusetts Medico-Legal Society, June 11, 1901.

stains are brought for examination, which consist of the products of suppuration, in which cases they contain chiefly pus mixed with more or less blood.

Preliminary examination.— One of the most important parts of the medico-legal examination of blood stains is the preliminary examination, which consists of a very careful observation of the gross appearance of the stains. This may throw a great deal of light upon the case, particularly with reference to the age of the stains and to the direction from which the blood came which made the stain.

In the first place, the color of the stain should be observed. A blood stain, when exposed to the ordinary action of light and air, grows perceptibly darker for a period of about 10 days. The blood color changes from the bright light red of a fresh stain to a distinct brownish color at the end of 10 days, as may be seen by these specimens (exhibits shown). If a blood stain has been exposed to the action of direct sunlight, it quickly becomes changed to a deep brown, owing to the decomposition of the hemoglobin to hematin. If this exposure is continued sufficiently long, still further decomposition of the blood pigment will occur, and hematoporphyrin will be formed. This same change will be caused by the action of heat also. In this case the color is still darker. Thus we can tell, from the color of a blood stain, whether it is perfectly fresh, or whether it is an old stain.

The next point of importance is the exact form of the blood stain. In some cases, after the blood has been spattered, the shape of the stain will sometimes show very accurately the direction from which the blood came, with reference to the object upon which the blood stain is situated. When a drop of blood strikes upon a smooth surface at an angle more or less acute, the form of the stain assumes more or less the shape of a pear,— the portion farthest away from the source of the blood forming the stem of the pear, while the broader end of the stain, corresponding to the body of the pear, will be nearest the point from which the blood came. Under certain circumstances, also, the largest volume of the blood in the stain will be found at the end of the stain farthest from the point from which the blood came. Thus, when the surface upon which the blood drop impinged be horizontal, the largest amount of the blood will be found at the stem end of the pear-shaped stain, so that the dried stain will be thicker at this end than at the broader end. If, however, the surface upon which the blood impinged be vertical, then the fresh stain is influenced by the force of gravitation, and the bulk of the blood will gravitate back to the lower part of the stain, in case the point from which it came is below the point upon which it has been formed. If the surface upon which the drop of blood has impinged is a very rough surface, it will coagulate so quickly that, even though the

surface be vertical, the bulk of the blood in the stain will remain at the stem end of the pear-shaped stain, and will not gravitate back to the broader end, in case the direction of the blood drop was from below upwards. This point has been very important in some cases, as, for instance, when the blood has spattered from a body lying upon the ground, the spatters striking upon the surface of a shaggy overcoat, or other garment, worn by the person committing the assault. If the drop of blood strikes any object at right angles to the object, the form of the stain is usually round.

In fresh blood stains it is sometimes of great importance to observe whether the stain is completely or only partially dry. This is more liable to be of importance in cases in which the amount of blood in the stain is very considerable. This was well illustrated in the famous Borden cases, the difference in the appearance of the blood clots under the bodies of the two victims showing conclusively that between one and two hours must have elapsed between the time of death in the two cases. This difference in the appearance of the blood in the two cases was due to the difference in the extent to which the blood has dried. A drop of blood dries much more slowly than a drop of water of the same size. The drying of the blood stain will be influenced somewhat by the condition of the atmosphere, but only within comparatively narrow limits. In one experiment which I made to determine the rapidity with which a blood stain dries, I allowed one drop of blood to drop from my finger on a piece of smooth pine wood. It made a stain three-eighths of an inch in diameter. At the end of one hour it was just beginning to shrink a little upon the edge of the drop, and the surface was just beginning to glaze over; it did not become completely dry until two hours had elapsed; this experiment was performed in a room which was of the ordinary temperature and ordinary atmospheric conditions, in December. Of course, the process of drying, of glazing over, and of contracting is much slower in the case of a large pool of blood than in a case of a single drop.

In the preliminary examination of a garment or other object for suspected blood stains, it is always necessary to carefully examine each stain first with the naked eye, noting the color, shape and general appearance of the stain, and also its exact position, so that it can be identified afterwards with absolute certainty. In the case of very small stains, which are liable to become partly rubbed off by manipulation of the garment, so that they cannot be readily found afterwards, it is best to mark them in some way. My own habit is to place a pin underneath a small stain which is rather difficult to see, so that it can be easily found afterwards. After examining each stain carefully with the naked eye, it should then be examined with a magnifying glass. This will

sometimes enable us to detect foreign matters mixed with the blood. The detection of foreign substances in a blood stain is often of very great importance. Sometimes this can be done by the unaided eye, sometimes it is necessary to use a magnifying glass, and in some cases it is necessary to resort to a microscopic examination for that purpose. Foreign substances which are liable to be of importance in medico-legal cases are: pieces of hair coming from the victim, or a cloth fibre, which may throw light upon the nature of the body from which the blood came, or particles of tissue, such as adipose tissue, muscular fibre, or pieces of bone with the muscular attachment, in cases in which the body of the victim has been sufficiently mutilated by a club or hatchet to separate portions of these tissues.

In one case with which I was familiar, a blood stain was brought to me for examination, which proved to contain a piece of bone with the muscular attachment. This stain was found upon the side of a barn in which the body of the victim had been dismembered, the legs and arms having been chopped off with an axe. This stain was not found until too late for the evidence to be admitted at the trial. Had it been, it would have resulted in a change in the verdict from one of acquittal to that of conviction, as the defence was that the blood about the barn came from bleeding a horse, and the jury at that time doubted the possibility of distinguishing between the blood of a horse and that of a human being.

The systematic examination.—In the systematic examination of blood stains for medico-legal purposes, we resort to three distinct methods: (1) The chemical tests; (2) the optical method, and (3) the microscopic examination for the detection of the red blood cells. The first two methods serve to detect only the blood pigments, and, if we obtain a positive result by these methods, we are only able to say that the stain contains blood, without any reference to the kind of blood. They do not serve to distinguish between human and animal blood, nor by means of these tests can we determine whether the stains came from a mammal, bird, fish or reptile. To distinguish between the different kinds of blood, it has been customary heretofore to rely solely upon the third method,—the microscopic examination, with high powers for the purpose of recognizing the form and size of the red blood cells.

Chemical tests.—I will not attempt to describe the chemical tests in detail, but will merely mention some of the most important points in connection with the different tests.

The guaiacum test.—This test has been known for many years, and depends upon the fact that when a solution of blood pigment, hemoglobin, is treated with a little tincture of guaiacum, and then with some solution containing ozone, a bright blue color is produced immediately.

Formerly old spirits of turpentine, which contains ozone, was used, but more recently this has been replaced by peroxide of hydrogen. This test is of no value scientifically, because a great many other things will give the blue color when treated with these reagents, such as some of the iron compounds and indigo. The great value of this test is as a preliminary one. It is so easily performed, and gives such a marked reaction so quickly, that it is extremely valuable as a preliminary test. Its value also depends upon the fact that, if we obtain a negative result on applying the guaiacum test, we may be sure that the stain tested does not contain any blood, and we need not, therefore, resort to any further examination with that stain. If, however, we obtain a positive result, we are not absolutely sure that the reaction is due to blood pigments, so that this test alone, uncorroborated by any other, is of no value medico-legally.

There is a modification of this test, which I have been in the habit of using recently, which is extremely valuable, especially in the case of very old blood stains. A minute fragment of the stain is removed and placed in a small porcelain capsule, and moistened with a drop of a solution of chloral hydrate, which is an excellent solvent for blood pigment. To this is then added a drop or two of a 1% solution of guaiacum in a 70 to 75% solution of chloral hydrate; allow this mixture to stand for some minutes, then a drop of the following solution of peroxide of hydrogen is added: 15 cc. of a 3 to 5% solution of peroxide of hydrogen free from acids, with 25 cc. of alcohol, 5 cc. of chloroform, and 1.5 cc. of glacial acetic acid. If any blood pigment is present, the blue color will appear immediately.

Hemin test.—If the result of the guaiacum test was negative, I do not consider it necessary to perform any other chemical test for blood. If, however, a blue color was obtained with the guaiacum test, it shows that blood may be present in some form or other, in which case it is necessary to confirm the guaiacum test by the other tests for blood. The most important one of all is called the hemin test, or sometimes Teichmann's test for blood crystals. This is a test which I have used for a very long time, and the method of performing it is well described in all of the books, so that I will not mention the method in detail. When the hemin crystals, or so-called blood crystals, form as the result of this test, they are seen under the microscope in groups of very characteristic, brown rhombic crystals, which cannot be mistaken for anything else. A single crystal may possibly be mistaken for a particle of carbon, which happens to have a rhombic form, but when any blood pigment is present, the crystals will form in such large numbers, that there is absolutely no possibility of making any mistake in regard to their character.

There are many agencies which will decompose normal blood pigment to such an extent as to prevent this reaction. Any substances or agencies which decompose the hemoglobin or hematin to the extent of forming hematoporphyrin, which is a decomposition product of hematin, and used to be called iron-free hematin, will prevent naturally both of the above reactions, which depend upon the presence of hematin. The following are among the most important agencies which have this effect, to some of which, you will readily recognize, an ordinary blood stain may be exposed: If the blood stain be exposed to the action of direct sunlight for a sufficient length of time, or if it be heated to a temperature of 140° C., or to 120° C., for twenty minutes or half an hour, the normal blood pigment will become so much decomposed, that it will not give the guaiacum or hemin reaction. If the blood stains be treated with many substances which are used as disinfectants or germicides for the purpose of destroying vermin, the same decomposition of the blood pigment is liable to take place, and the stain will not react with the guaiacum or hemin test. Of the more common substances which will have this effect, are alcohol, naphtha, benzole, turpentine, and some of the disinfectants which contain chloride of aluminum, such as "bromochloralum." These substances, however, fortunately do not destroy the red blood cells, but, on the contrary, tend to fix them so that they are not destroyed or affected afterwards by treating a portion of the stain with water or any aqueous solution. This fixing of the red blood cells is sought after by the clinician in preparing blood slides for the clinical examination of blood. Usually the cover-glasses are heated, but sometimes the blood is fixed by a mixture of absolute alcohol and ether. Many years ago, before the days of the clinical examination of the blood, I learned this fact in following out some investigations connected with the famous "belfry" murder. An individual suspected of having committed this murder was followed to Ireland and brought back to this country. A pair of trousers, supposed to have belonged to him, was found in a vault, covered with filth and containing what looked like blood stains. The officer who found the trousers, in order to disinfect and deodorize them, had soaked them in bromochloralum, using a gill of bromochloralum to a pailful of water. The trousers were then washed and brought to me for examination. I found near the bottom what appeared to be well-marked blood stains, but upon performing the chemical tests, I could not get any reaction. Upon treating a portion of the stain with an artificial serum, and examining the preparation with the microscope, I found perfectly preserved biconcave discs of the red blood cells, which could be accurately measured. On experimenting, I found that fresh blood stains upon cotton cloth, treated with a dilute solution of bromochloralum, were sufficiently decomposed to prevent the

chemical tests for the blood pigment from being obtained. Afterwards, on soaking clothing in naphtha to destroy the vermin, I found that the same effect was produced upon the blood stains. In a case recently reported in one of the German journals, the same result was noted in the case of a blood stain upon a piece of cloth which had been ironed with a hot iron.

Sodium tungstate test.—This test I consider of great value in cases of washed blood stains, or in cases in which it is necessary to test a liquid for blood. The solution used for this purpose is a saturated solution in water of sodium tungstate rendered strongly acid with acetic acid. The substance containing the washed stain is soaked in water, or sometimes in water to which a drop or two of sodium or potassium hydrate has been added, in order to dissolve out the blood pigment. This solution is filtered, rendered acid with acetic acid, and a little sodium tungstate solution added, which will produce, if any blood pigment is present, a precipitate; the mixture is then heated to boiling, which will cause the precipitate to aggregate together and become chocolate brown in color. This precipitate can be collected on a filter, washed, a part removed to a glass slide, and the hemin test performed with it, when the characteristic hemin crystals will be obtained, if any blood pigment was present.

The spectroscopic test.—This is the so-called "optical" method used for the medico-legal examination of blood. Unfortunately, the application of this test requires that we have a considerable volume of blood to deal with. Extremely minute stains do not furnish a sufficient amount of material to enable us to apply the spectroscopic test. The only practical instrument for use in medico-legal examinations is the spectroscopic eyepiece, which can be set into the tube of a microscope, sometimes called the microspectroscope. By means of this method we are able to detect the hemoglobin or any of its decomposition products. I will only briefly mention the results which can be obtained by this method. As you all know, a dilute solution of oxyhemoglobin, examined by the spectroscope, shows the two absorption bands described in all books upon this subject. If the solution of oxyhemoglobin be deprived of its oxygen by treatment with some reducing agent, like sulphid of ammonium, these two bands are merged into each other, forming a single band, which is the spectrum of hemoglobin. There is another compound of hemoglobin with oxygen, in which the oxygen is more firmly fixed. This compound is methemoglobin, which is produced in the body in cases of poisoning by potassium chlorate, and is formed also after death in the body as the result of putrefaction. A solution of methemoglobin gives a characteristic spectrum. If a solution of hemoglobin, or a little dilute blood, be treated with acetic

acid, the color changes to a deep brown, owing to the formation of hematin. The acetic acid decomposes the hemoglobin into the colored product, hematin, and the proteid, globin. This solution examined with the spectroscope gives a characteristic spectrum of acid hematin. Alkaline solutions of hematin examined with the spectroscope give also a characteristic spectrum. If the alkaline solution of hematin be treated with a reducing agent, another decomposition product is formed, called hemochromogen, which also has a characteristic spectrum. The next decomposition product is hematoporphyrin, which is of great importance both medically and medico-legally. Hematoporphyrin is produced from ordinary blood pigment, if it is subjected to the action of any agencies which will deprive the hematin of its iron. This is the product which is formed by means of all of those agencies mentioned above as preventing the hemin reaction. Hematoporphyrin is formed in the body sometimes, and appears in the urine, as in some cases of sulfonal or trional poisoning, and in some cases of chronic lead poisoning. It can be obtained from blood, or a blood stain, by heating it with concentrated hydrochloric or sulphuric acid. This is the decomposition product which we find in very old blood stains, or in blood stains which have been heated; and the only chemical test of any value in such stains, where we cannot obtain the guaiacum or the hemin reaction, consists in the recognition of the hematoporphyrin by means of the spectroscope. If a little of the stain be dissolved in a dilute alkali, we may obtain the spectrum of hematoporphyrin in alkaline solution, or, if it be dissolved in a drop of concentrated sulphuric acid and diluted, we may obtain the spectrum of hematoporphyrin in acid solution. Another compound of blood pigment, which is sometimes important medico-legally, is the compound of hemoglobin with carbon monoxide, called carbon monoxide hemoglobin. This is the compound which is formed in cases in which persons are poisoned by carbon monoxide gas, as from inhaling the fumes arising from burning charcoal, or in the much more common form of poisoning by inhaling illuminating gas. The carbon monoxide hemoglobin spectrum is pretty nearly the same as the oxyhemoglobin spectrum, but it differs from the oxyhemoglobin in that, when treated by sulphid of ammonium, it does not change. The two bands still remain, and are not merged into a single band, as is the case with oxyhemoglobin.

Microscopic examination.— All of the tests and methods mentioned above enable us to state only whether blood of some kind or other is present or not. They give us no information, however, as to the kind of blood,— as to whether it comes from a mammal, bird, fish or reptile. In order to obtain any information as to the kind of blood, we must resort to such a microscopic examination of the blood stain as will en-

able us to see the form and the size of the blood cells. For this purpose it is usually necessary to use the higher powers of the microscope. By means of this examination we can always distinguish with certainty between the blood of a mammal and that of a bird, fish or reptile, because the red blood cells of birds, fishes and reptiles have a distinct nucleus, and most of them are oval in shape, while the red blood cells of the mammals are round biconcave discs, with the exception of those mammals belonging to the camel tribe, whose red blood cells are oval in shape, but do not have any nucleus.

To distinguish between human blood and the blood of other mammals (except that of the camel tribe), the only method used up to recently, has been the determination of the size of the red blood cells by measuring their diameter, by using a micrometer eyepiece in connection with high power objectives, so as to get the average diameter of a large number of the red blood cells in any given stain. If this average falls within the limits of the average measure of human red blood cells, from $\frac{1}{3200}$ to $\frac{1}{3300}$ of an inch, we may report that the blood cells in this stain are consistent with their being of human origin. If we find that the average diameter of the red cells in the given stain is less than $\frac{1}{4000}$ of an inch in diameter, we are warranted in reporting that the red blood cells in this stain are inconsistent with their having been of human origin.

Fortunately, the average diameter of the red blood cells of most of the domestic animals is less than $\frac{1}{4000}$ of an inch. The dog is the only domestic animal whose red blood cells approximate in size those of the human being. The red blood cells of the dog average $\frac{1}{3500}$ to $\frac{1}{3600}$ of an inch. Of other animals, whose red blood cells might be mistaken for those of the human being, are the monkey, opossum, guinea-pig, kangaroo, muskrat, rabbit, rat and mouse, with a few other wild animals, such as seal, prairie wolf and woodchuck. The red blood cells of the pig, ox, horse and cat average between $\frac{1}{4200}$ and $\frac{1}{4500}$ of an inch, those of the sheep $\frac{1}{5000}$, and of the goat less than $\frac{1}{8000}$ of an inch in diameter.

The most important detail of the medico-legal expert's work is the preparation of the blood stain for this microscopic examination, which has for its object the detection and measurement of all of the red blood cells which have preserved their normal shape and size, and the prevention of such normal red blood cells from becoming swollen, so that the diameter becomes changed. First, in removing a portion of the blood stain for microscopic examination, we should endeavor to select that portion of the stain which has dried most quickly, because, with any stain of considerable size, the blood dries so slowly, particularly in the centre of the stain, that the vast majority of the red blood cells become altered

in form and size. In such a stain, therefore, it is always best to remove a portion from the edge, where the drying has taken place most quickly. If the blood stain is upon a piece of cotton or linen cloth, the fibre of which absorbs the blood rapidly, it does not make much difference, although, even in this case, I generally select a fibre near the edge for the microscopic examination. Before treating the portion of the stain, which has been removed, with an artificial serum, and mounting on a glass slide, I have of late years been in the habit of setting the red blood cells by one of the methods which are in common use in the clinical examination of blood. The stain may either be heated to 120° C. for 15 or 20 minutes in a hot air bath, or it may be treated with a drop or two of a mixture of equal parts of absolute alcohol and ether in a watch glass for about the same length of time. Then a minute fragment of the stain thus prepared may be transferred to a glass slide, treated with some artificial serum, which may, or may not, contain some staining fluid which would color the red blood cells, so that it is somewhat easier to see their border. I am in the habit of using a normal salt solution, or a solution of potassium acetate of about 1,030 specific gravity, to which a little eosin has been added, for the purpose of staining the red blood cells. This brings out the borders of the cells a little more sharply, so that it is a little easier to measure the diameter. When a fragment of a blood stain, or a fibre of cloth containing it, is placed in the artificial serum on a glass slide, it may be gently picked to pieces by means of needles, then covered with a No. 1 cover-glass, and sealed with some cement, which will prevent the evaporation of the fluid. It may then, at any convenient time, be examined with the microscope, using an oil-immersion lens and an eye-piece micrometer, the value of the divisions in the eyepiece micrometer having been previously ascertained by means of a standard object micrometer. (Photographs shown of perfectly preserved red blood cells from a stain of dog's blood, which had been dried three weeks, and also of cells from a human blood stain, which had been dried on paper 16½ weeks at the time when the preparation was made.)

It is well to make quite a number of slides from the different blood stains, for the purpose of finding foreign substances, which may be of importance, mixed with the blood. In the case of blood coming from the nose, we usually find mixed with it a large amount of mucus, and we may find some epithelium coming from the Schneiderian mucous membrane. In the case of some menstrual stains, we usually expect to find squamous epithelium from the vagina mixed with the blood, particularly at those times when the flow is not profuse.

The agglutination test.—This is a new method. I have not had time to investigate this method personally. It is stated, however, on very excellent authority, that it is possible now to distinguish with ac-

curacy between human blood and that of any other animal by what is sometimes called the agglutination test.

The principle upon which this test depends lies in the fact that, if a clear human blood serum be treated with a dilute solution of other human blood, a cloudiness or precipitate occurs. If clear human blood serum be treated in the same way by a solution of animal blood, no precipitate or cloudiness occurs, but the mixture remains perfectly clear. If the clear blood serum of any animal be treated with the solution of the blood of one of its own kind, the precipitate will occur, but if treated in the same way with the solution of human blood, the mixture remains clear. But it has been found that an animal may be what is called humanized, so that its blood serum will react when treated with the solution of human blood. Any of the domestic animals may be humanized, but a rabbit is usually selected. This is done by injecting into the peritoneal cavity or blood vessels of the animal about 10 cc. of human blood, or human blood serum, five or six times, at intervals. If a little of the clear blood serum of the humanized animal be treated with a solution of human blood, a precipitate will be formed. It is found that this test is just as applicable to a dried stain as it is to fresh blood. It is necessary to make a solution of the dried blood in sterilized normal salt solution. A little of this solution added to the clear serum of the humanized animal will give a precipitate, if the blood stain was made with human blood.

CASE OF ATTEMPTED CRIMINAL ABORTION IN EXTRA-UTERINE FETATION.[1]

BY W. D. SWAN, M.D., CAMBRIDGE, MASS.

E. B. P., married woman, 25 years old. Had one child living. Was seized with violent pains in the abdomen on the morning of Feb. 9, 1898. She told her husband that on Feb. 7, two days previous, she had visited a certain female physician in Boston who had examined her and introduced instruments into the womb for the purpose of "bringing her round." Her last menstruation was on Dec. 20, or about 7 weeks previous.

She was attended in the afternoon of the ninth by two physicians, who examined and curetted the uterus. She died in the afternoon of the following day.

Autopsy.— Sixteen hours after death. Body of a well-formed and well-nourished young woman. Anterior surface and mucous membranes generally pale. Back livid purple, except where subjected to pressure. There was a small discharging sinus on each side of the neck, and enlarged lymphatic glands about them. There was a purple spot on the outside of the left thigh from hot applications. Breasts and nipples small; areolæ pale; abdomen distended; thin, reddish, odorless discharge from the vagina. Vaginal mucous membrane shows small excoriations about the cervix and os uteri; a small old recto-vaginal fistula. On opening the abdomen, the peritoneal cavity was found to contain three pints of dark fluid and clotted blood. Peritoneum everywhere smooth and glistening. The left lung contains a few hard cicatricial nodules in the apex. Other organs contain little blood, otherwise normal.

The uterus and its appendages removed for examination. Dr. W. F. Whitney reports on these as follows: "The specimen consists of the uterus and appendages. The uterus is slightly enlarged, the upper portion of its cavity for a distance of 1½ cm. being covered with a thin soft membrane. The tube on the right side, about 3 cm. from the uterus, has a ruptured swelling from which protrudes a mass of clotted blood and fine filaments. The tumor measures 3 cm. in diameter. The right ovary contains a corpus luteum. On the other side the tube is adherent to the ovary, and covered with a more or less dense membrane."

There was no appearance of sepsis.

The police stood ready, on the completion of my autopsy, to cause the arrest of the female physician mentioned above, if my report warranted

[1] Read before the Massachusetts Medico-Legal Society, Oct. 2, 1901.

it. The direct evidence of a criminal operation having been destroyed by the attending physicians who introduced instruments into the uterus, I reported that death was due to spontaneous rupture of a tubal pregnancy and the resulting hemorrhage, and that there was no evidence of a criminal operation, there being only the unsupported statement of the husband. That ended the case.

If there had been good evidence of a criminal operation the case would have been prosecuted as in a case of normal pregnancy, the crime consisting in the attempt to produce an abortion.

Did the attempt to produce an abortion in this case cause rupture of the existing tubal pregnancy? In view of the fact that the tumor almost invariably ruptures before the end of the twelfth week, from the tubal structures having reached their limit of distention, it would be always difficult to establish the connection from a medico-legal point of view. It seems to me that it is not well to institute proceedings against an abortionist without extremely good and direct evidence. Failure to convict does more harm than good.

THE RELATION OF THE PRESS TO THE MEDICAL EXAMINER.[1]

BY GEO. A. HOUGH, ESQ., NEW BEDFORD, MASS.

My rearing in the family of a physician, and breathing an atmosphere of medicine, and daily association with doctors from infancy to manhood, have familiarized me with the ethics of your profession and inculcated me with a reverence for traditions which the life of an active newspaper man, in constant contact with people of every shade of opinion and in every strata of human existence, has since done much to shatter; so it was with gratitude to the committee of the Medico-Legal Society that I eagerly embraced this privilege of saying a few words to you, from the standpoint of an editor, on the relation of the medical examiner toward the press.

The relations of the reporter — the active agent of the press — toward the medical examiner are no more intimate than his relations with a hundred public functionaries — the priest or the policeman, for instance. As a representative of the reading public in all matters of human interest, the reporter is brought, by marriage and death, in contact with the clergyman on terms of confidence.

The thousand petty violations of the law keep him in touch with the uniformed guardians of the peace; while violence, whether accidental or criminal, sends him on the same errand of investigation as the medical examiner.

The solution of satisfactory relation with the press on the part of all these and other servants of the people is very simple. It lies in the official's recognition of the fact that the newspaper is the public's exclusive bureau of intelligence, and that, as an official, he is but a creature of the public, and in duty bound to furnish the newspaper the information the public has a right to demand.

There are occasionally men in public office who need to be reminded of their obligations in this respect, and it is fair to assume that none might more easily become forgetful than a class who are so far removed from the people as to hold appointive rather than elective commissions for seven-year terms. The grave mistake made by such

[1] Read before the Massachusetts Medico-Legal Society, Oct. 2, 1901.

men is in the erroneous assumption that the newsgatherer is merely an individual imbued with a personal curiosity, that he is presumptuous and impudent in his demands for what is none of the public's business.

I insist that the public has every right to know the methods of procedure of its servants, and that the standard of the press of Massachusetts is so high that the managers thereof should be recognized as the most competent judges of what details should be withheld, and are men who may be trusted to discriminatingly exercise that judgment.

My connection with the press dates back nearly to those busy days for the medical examiners following the memorable calamity to the Savannah liner *City of Columbus* in 1884, when every boat brought bodies of the victims to New Bedford, and the wardrooms of the city were converted into morgues. It has extended through a series of remarkable murder trials, of which southern Massachusetts has had more than her share and with which many of the members of this society are familiar. In all those years I have never known the ends of justice to suffer through publicity, nor official confidence in a reputable newspaper man to be abused.

The oft-repeated fallacy of "defeating the ends of justice" through newspaper publicity is a spectre usually conjured up by drones among the police headquarters' detectives, and is unworthy the consideration of more intelligent men.

I may say, by the way of digression, that my familiarity with the workings of the police department of New Bedford has not given me an exalted opinion of the character and ability of the average police detective, and has perhaps led me to accept with too free credulity, as unvarnished facts, those cleverly written magazine stories of the powers that rule and the powers that prey, by "Josiah Flynt." It is certain to my mind that the revelations of police corruption in New York City may be duplicated on a scale only limited by the size of the force and of the population, in one New England city with which I am fairly familiar in darkness and daylight, where few men of pronounced character and ability attain the higher executive positions, and even a sergeant's stripes are to be gained through pull more than by merit. I have dwelt upon this, inasmuch as the medical examiner is often the sufferer through the ignorance of the police, and it is the aim of my remarks to impress upon you that the reporter should be your intelligent and trusted ally.

In one of the most revolting cases of manslaughter that New Bedford has known, in recent years, a drunken brute hurled a lamp at a woman, resulting in her death under the most distressing circum-

stances. The carefully prepared evidence of the medical examiner came to naught, and the criminal walked free, through the inexcusable blundering of a high police official, who neglected the usual formalities in taking down the victim's antemortem statement. The unnecessary veil of secrecy was drawn about that case.

If the co-operation of one of the wide-awake, intelligent young men, sent by the newspapers to cover that crime, had been secured, there would have been no flaw in that dying woman's deposition, enabling a brute to escape state's prison on a trifling technicality. Instead of the mantle of mystery there would have been wholesome publicity, so jarring to the nerves of the incompetent in public life.

There is a lesson to be drawn from this incident in the observation of "Josiah Flynt," which has strongly impressed me, that the municipal police department offers a splendid field for well-educated, active young men of force of character — just such men as the medical examiner will encounter among the newspaper representatives who gather whenever he is summoned on a capital case.

I wish to impress upon you, to the best of my ability, that it is your duty to learn to know these young men; then you will have faith in them and make them your trusted friends. The character and attainments of the young men who are entering the reporters' ranks today should command your respect. Massachusetts is free from the taint of so-called "yellow journalism." I do not believe there is a widely circulated newspaper printed in the State which would knowingly spread a lie before its readers under the guise of truth.

It is a praiseworthy attribute of 99% of newspaper men that their loyalty and devotion to the paper they serve is as unswerving as that of any mother for her child. I dare say that there are few editors or reporters in the State who do not take the same pride in and as jealously strive to protect and extend the good name of the newspaper they represent as I do that of the New Bedford *Evening Standard.*

During two recently celebrated criminal cases, in the horde of correspondents who swept down upon Cambridge during the Eastman trial or hovered about Pittsfield during the investigation of the Fosburgh mystery, you may have encountered men, lacking in principle, who misrepresented you and abused your confidence. Yet they are few in number and excite the contempt of the great body of newspaper men, as "quacks" call forth the derision of the medical profession, or "shysters" the condemnation of the bar.

Strange as it may seem to you medical men, I assure you that, to the lay mind, what appears to be the deceit of members of your profession at the bedside of two martyred presidents has done more to shake the public's faith in what it is told than the wildest statements of some of

the sensational sheets sent here from other states. There is an unaccountable similarity of cheerful words, that do not seem to have been heartfelt, in the bulletins sent out from the death chambers of Garfield and McKinley that defies public understanding — a strange illustration, it seems to me, of hiding the truth — a hesitancy to tell the people of a sorrowing nation what they had a right to know.

I will relate what has always proved to me an entertaining reminiscence, showing one of those curious out-croppings of official distrust of the people at large. Almost 10 years ago to a day the district attorney of southeastern Massachusetts (the present attorney-general) was preparing for a notable murder trial — you may recall the so-called "Egg Island tragedy" — in which many medical experts were called. Peter Johnson, a Gay Head Indian, a Civil War veteran, and one of the brave life-savers at the *City of Columbus* disaster, had been shockingly murdered with a hatchet, in his little fishing boat on a small island in New Bedford harbor. The body of the victim, after the autopsy, was interred in the soldiers' and sailors' lot in a New Bedford cemetery. To strengthen the government's case, apparently, after consultation with the medical examiner, the prosecuting officers of the Commonwealth decided to disinter the body of Johnson, decapitate it and scientifically prepare the battered skull to exhibit to the court.

The newly appointed medical examiner at that time resided in the same house with me. On returning home one October evening my curiosity was aroused by a huge tin pail, which seemed strangely out of place behind the front door. It was the act of only a second to raise the cover, but before the lid was removed the near-by telephone bell jingled. A message from an excited fellow newspaper man dissipated all my thoughts of the incongruity of mammoth tin pails as front hall adornments. I have never been told what the pail contained, but I have always had a strong suspicion that had the cover been removed I should not have needed to be told of the visit to Johnson's grave. As it happened, the news came through another channel. The story appeared in the papers the next day, and the publication was followed by a vigorous demand from the district attorney for the name of the person "who had improperly disclosed the business of the Commonwealth." I recall that the request was made purely in the interests of justice. In my newspaper career that is the only occasion that I can recall in which I was directly accused of having prejudiced the public interests.

Ten years have not changed my opinion that there was no necessity of making a dark mystery of that legalized grave-robbing expedition. There was no good reason for hiding from the public the preparation of that skull to serve the requirements of justice. The murderer was in his cell. He could not escape. His counsel were not to be expected

to be caught napping, and there was nothing lacking in the spectacular when the fleshless head, with the fisherman's old felt hat thrust upon it, was produced in court. The dramatic effect may even have been heightened by the anticipation.

There is no reason today to believe that the attorney-general has not forgotten the incident. Certain it is that the source of information was never revealed, and he who gave it continues high in the esteem of both the prosecuting officers and the newspaper men, as he deserves. I may add that I might have long ago forgotten this incident myself, but it was indelibly impressed upon my mind soon after by the district attorney, who demonstrated that a reporter of a rival paper enjoyed his confidence by engaging him to prepare the official photographs of the scenes of the tragedy for the trial, which he was permitted to publish, while no persuasion on my part could obtain for me possession nor even a peep at the negatives of proof.

The grim satisfaction was afforded me, as a newspaper man, of knowing that a local post of the Grand Army, stirred by the publication of the story of the decapitation, promptly insisted, immediately after the trial, upon the restoration of the skull, which might at this day have adorned a medical museum, to a comrade's grave, and thanked the press for the news. What harm came or could come from the publication of an incident like this? Is it to be regretted? Or is it not true that, science having attained her ends, the triumph of sentiment still teaches a lesson in respect for the dead?

There are brighter moments in a young reporter's routine than when he is first dispatched to join the medical examiner. From youthful environment, parental guidance or the law of heredity if you please, it might have been expected that I would have studied medicine and now be in the enjoyment of the comfortable practice of a physician. Fortune and a sickness at the sight of blood decreed for me another walk in life. I fled from the operating table ("the foot with the bullet wound, . . . the gnawing and putrid gangrene so sickening, so offensive") to become a reporter at once, to be sent to see "the suicide sprawls on the bloody floor of the bedroom; I witness the corpse with its dabbled hair; I note where the pistol has fallen," and I meet the medical examiner.

There is where the newsgatherer usually first meets the medical examiner, and he meets him many times afterwards, always on some grewsome errand — on the harbor shore by the dripping body of an unfortunate given up by the waters, near the railroad crossing viewing the mangled remains of a child cruelly crushed by the car-wheels, or in some squalid spot in the sinks of the city where he has been summoned to gaze upon hideous human butchery.

Both are there in the public interests — the medical examiner as an expert on the human body, the reporter as an expert in human nature. Their duties at the time are not dissimilar,— a dispassionate survey of surroundings and conditions, the result of which is to be summed up in a calm recital of the facts,— one for the legal authorities and the other for the people from whom all legal authority is derived. Why should they not rely upon and trust each other?

THE SERUM TEST FOR BLOOD.[1]

BY E. S. WOOD, M.D., BOSTON,
Professor of Chemistry, Harvard Medical School.

DURING the past ten years the immense amount of work which has been done upon the blood, in the study of various questions concerning antitoxins and immunity, has resulted in the discovery of the formation in the blood of various specific antibodies, such as the antitoxins, and also of certain specific precipitins, which will produce precipitates in different bacteriological products, in different kinds of milk and in different kinds of blood. The study of these bodies is still in its infancy, and offers a vast field for special investigations.

I need not go into the details of previous work done upon these bodies. The investigations of Krause, in 1897, first demonstrated the presence in the blood of the specific precipitins in the antisera of the cholera, plague and typhoid. Those of Bordet, in 1899, showed the formation in the blood of the rabbit of the specific antibodies which act upon milk. The antibodies formed acted only upon the special kind of milk with which the rabbit was treated. If the rabbit was injected with human milk, its serum precipitated the casein from human milk only; its serum would not precipitate the casein from cow's milk or goat's milk. Later, these results were confirmed and the investigations extended, so as to demonstrate the formation in the blood of antisera, which acted upon the different kinds of blood or blood serum. The first discovery of blood antisera was made by Tchistovitch in 1899, and his work has been confirmed and extended since then by Uhlenhuth, Wassermann and Schütze, Myers and Nuttall.

It has been found that rabbits are the animals which are best suited for this kind of experimentation. If a rabbit is prepared by injecting into the peritoneal cavity, several times, at intervals of a few days, about 10 cc. of any kind of blood or blood serum, there will be formed in the blood of that rabbit a peculiar body, called by Myers and Nuttall a specific *precipitin*, which will produce a precipitate, called by them the *precipitum*, in the diluted blood or blood serum of an animal of the same kind as the one with which the rabbit was prepared. It will not produce a precipitum in the diluted blood or blood serum of an animal of any other kind unless it be very closely allied generically, nor will

[1] Read before the Massachusetts Medico-Legal Society, Jan. 4, 1902.

it produce a precipitate with the dilute blood or blood serum of a normal rabbit. A rabbit may also be treated with any pathological fluid containing human blood serum, such as pleuritic exudation and, as Dr. Whitney has determined, hydrocele fluid, instead of blood serum, when the precipitin will be formed which will produce the precipitum in diluted human blood.

Uhlenhuth, in February, 1901, prepared rabbits both with human blood and ox blood, producing in the rabbit human antiserum in one case and ox antiserum in the other. His comparative tests were made with the blood of man, ox, horse, donkey, pig, sheep, dog, cat, deer, fallow-deer, hare, guinea pig, rat, mouse, rabbit, chicken, goose, turkey and pigeon. No precipitum was formed in the diluted blood solution of any of these animals except the one with which the animal was prepared.

Uhlenhuth made the important discovery that the precipitate was produced in clear solutions made by treating dried blood stains with normal salt solution, just as well as in diluted fresh blood.

Wassermann and Schütze, also in February, 1901, found that it was not necessary to treat the rabbit with blood, but only with the blood serum. The hemolysins obtained by treating the rabbit with the red blood cells, and the agglutinins formed by the action by the hemolysins upon the red blood cells, have no importance from a medico-legal point of view, since the red blood cells may be completely destroyed in blood stains which have been exposed to various conditions. For this reaction it is necessary that some red blood cells should be in suspension. These authors made comparative experiments with the blood of man, horse, donkey, goat, cow, ox, sheep, pig, dog, cat, baboon, guinea pig, rabbit, mouse, rat, goose, duck, chicken, sparrow, eel, pike and tench. They found that the antiserum from the rabbit prepared with human blood reacted also with the blood of the baboon, but much more slowly and less strongly than it did with diluted human blood.

Stern, February, 1901, found also that the blood of the humanized rabbit reacted feebly with the diluted blood of three different kinds of monkeys, a species of *cercopithecus*, *macacus cynomolgus*, *L.* ("Java-Ape"), and the "Crown-Ape."

Nuttall, July, 1901, made comparative experiments with thirty-six different kinds of blood; the bloods being those of man, four species of monkey: *Cercopithecus campbelli*, Waterh., *cercopithecus patas*, west coast of Africa; *cercopithecus lalandii*, Is. Geoffr., South Africa; *macacus rhesus*, India; the rufous rat-kangaroo (*hypsiprymnus rufescens* [Gray], New South Wales), the capybara (*hydrochoerus capybara*, South America); the polecat (*mustela putorius*), suricate (*suricata tetradactyla*), South Africa; squirrel (*sciurus vulgaris*), guinea pig, tame and wild rabbit (*lepus cumiculus*), white rat, black rat (*mus rat-*

tus), horse, ox, sheep, white-tailed gnu (*connochætes gnu*), South Africa; gazelle (*gazella arabica*), deer (*gervus axis* Erxl, India); dog, cat, pig, bat (*plecotus auritus*), pigeon, chicken, pheasant, swan (*cygnus olor*), duck, chaffinch (*fringilla cœlebs*), cross-bill (*nucifraga caryocatactes*), rook (*corvus fragilegus*), swallow (*hirundo urbica*), corn-crake (*crex pratensis*), frog (*rana temporaria*), newt (*molge cristata*), and snake (*tropidonotus natrix*). The serum of the rabbit, which was prepared with sheep's blood, gave a slight reaction with the blood of the gazelle and axis deer, and there was very slight clouding in the blood of the ox, squirrel and swan. The serum of the rabbit treated with ox blood gave a distinct reaction with the blood of the gazelle and axis deer, and slight cloudiness in the blood of the sheep, gnu, squirrel and swan. The serum of the rabbit prepared with human blood gave a slight reaction with the blood of the four kinds of monkeys tested. He found that it gave a very faint cloudiness in solutions of the blood of the horse, ox and sheep. The serum of the humanized rabbit gave positive reactions with diluted human serum, pleuritic exudation, both fresh and putrid, with blood which has undergone putrefaction for two months, with serum from a blister, and a slight reaction with both nasal and lachrymal secretions.

The method of humanizing a rabbit is to inject into the peritoneal cavity about 10 cc. of human blood serum at intervals of two or three days, until the rabbit has received six or eight injections. The details of this operation will be described to you by Dr. Whitney. The rabbit should be allowed to rest about a week after the last injection. The blood serum for performing the test may then be obtained either by killing the animal, by bleeding it from one of the large vessels, or, without killing the animal, by removing a little blood from one of the large veins of the ear. The blood thus collected should be placed in a cool place and allowed to coagulate. The serum which separates from the clot may be used for performing the test.

The blood to be tested should be prepared as follows: If it be fresh blood, it should be diluted about 1:100 with normal salt solution. Thus diluted it should have a light pink color, and this diluted solution, if not perfectly clear, should be allowed to settle until it is clear, and the clear supernatant fluid decanted into another test tube. If the blood to be tested is a dry blood stain, a little of it may be scraped off with the point of a knife on to a watch glass, if the stain be upon some hard surface so that the blood has not penetrated into the substance of the material. If the blood stain be upon cloth into which the blood has soaked, it is necessary to cut out a few threads and transfer them to a watch glass. These fragments of dried blood should then be treated with two or three drops of distilled water, until the soluble portion of

the dried blood has been dissolved. The clear solution is then transferred carefully to a very narrow test tube, and to this should be added an equal volume of double normal salt solution. The clear fluid thus obtained, either by diluting fresh blood or by dissolving the blood serum from the dried blood stain, is then tested by adding to it a few drops of the serum obtained, as above described, from the humanized rabbit. If the solution contains human blood serum, there will occur an immediate cloudiness which gradually increases, so that there is a distinct precipitation within one-half hour after the addition of the serum from the humanized rabbit. It is better to allow the antiserum to flow down the side of the test tube, so as to form a separate layer under the solution to be tested, in the same way that we add nitric acid to urine in testing for albumin. In this case the cloudiness and precipitate may be seen very distinctly in the zone at the point of contact of the two fluids. The precipitate occurs best when the mixture is kept at a temperature of about 37° C.

It has also been found that the antiserum obtained from the humanized rabbit can be kept in dried form by soaking filter paper or blotting paper with it and allowing it to dry. In this way it is said to preserve its activity for forty-two days more or less (Dr. Nuttall). When it is desired to use this for a test, it may be dissolved from the filter paper by means of a little normal salt solution and filtered if necessary. This clear solution, added to the diluted blood, or solution from a dried blood stain, will give the cloudiness and precipitation the same as the orignal antiserum obtained from the humanized rabbit.

I have recently applied this serum test in a murder case, which is now being tried in New Hampshire. The test was applied separately to the following stains: One about one-quarter of an inch in diameter on the right elbow of a brown jacket; another about one-half inch in diameter on the lower left front of the same garment. One-half of the stain on the elbow was cut out and soaked with a few drops of distilled water. The material from the other stain was obtained by scraping the surface of one-half of the stain with a knife on to a watch glass, and the powder thus obtained was treated with a few drops of distilled water. As mentioned above, this distilled water solution was transferred to a small test tube and treated with an equal volume of a double normal salt solution. Four small spatters on one leg of a pair of overalls were scraped off with a knife and treated in a similar manner; also one stain, about one-fourth inch in diameter, on the other leg of the same garment. A few threads from two blood stains on the towel were cut out, and a solution made as above described. Also some clotted blood found on a stone which weighed about three pounds, this being the implement with which the murder was committed, the victim being killed by blows upon

the head with the stone; a solution of this blood was made in a similar way. These solutions were placed in small test tubes side by side, and, for purposes of comparison, several other test tubes containing solutions of dried human blood, of that of a dog, ox, pig and sheep. All of these solutions being thus prepared, there was added to each one two or three drops of the test serum obtained from the humanized rabbit. A distinct precipitate occurred within one-half hour in the test tubes containing the fluid obtained from both stains on the jacket, those obtained from both legs of the overalls, from the stain on the towel, from the blood on the stone, and in the test tube containing the solution of known human blood. No precipitate or cloudiness occurred in the test tubes containing the solution of blood from the dog, pig, ox or sheep.

NOTES ON THE PRODUCTION OF THE TEST SERUM IN RABBITS.[2]

BY W. F. WHITNEY, M.D., BOSTON.

As a rule, with moderate care there is little danger of infection of the rabbits by the injection. The abdomen should be shaved and the skin thoroughly scrubbed with strong alcohol. The rabbit is held out straight by an assistant taking his ears in one hand and his hind legs in the other. The skin is pinched up with the left hand and the needle introduced by a steady thrust with the right. The only chance is that the point may not be inserted into the peritoneal cavity, but under the loose skin when liability of an abscess forming seems to be greater. Such has been the experience in two of our cases. After withdrawing the needle the abdomen should be again scrubbed with alcohol.

Any syringe that can hold 10 cc. and can be properly sterilized is all that is required. The one we have used is a glass antitoxin syringe with a long, relatively large needle.

The serum which can be most readily procured is hydrocele fluid (in any large hospital several are tapped every week, and each one gives about 200 to 250 cc. of fluid). Ascitic and pleuritic fluid are not quite so common, but the amount is so much larger that it can be used for more rabbits.

Serum can be kept for a long time if collected in a sterilized bottle under aseptic precautions, and a little chloroform poured in and allowed to remain at the bottom of the flask. The mouth can be plugged with sterilized cotton.

These sera have the advantage over those obtained from blood, that they are perfectly clear and do not have to be separated from the blood clot and corpuscles. Human blood serum is most readily obtained by squeezing a freshly delivered placenta and then allowing the serum to separate by clotting. The centrifuge is often needed to clear serum of stray corpuscles. About 6 to 8 cc. can be obtained from each placenta.

As to the relative advantage of the serum from one source or ananother, our experiments, as yet, are not conclusive. Krause says that hydrocele fluid does not develop as strong a reaction in the rabbit as the serum obtained directly from the blood. On the other hand, Uhlenhuth says there is great difference in the susceptibility of rabbits.

In our experience in two parallel series, the hydrocele rabbit gave the better reaction in one and the blood serum rabbit in the other. Further experiments are necessary before this can be regarded as settled.

[2] Read before the Massachusetts Medico-Legal Society, Jan. 4, 1902.

Is there any indication by which it can be known beforehand whether a rabbit will yield a strong antiserum? The only indication which we have on this point is that in both of those which gave the best reaction, the blood did not coagulate so quickly as in those which gave a poorer reaction. Whether this is a condition which is developed by the formation of the antiserum, or whether it pre-existed, we have no knowledge. If it pre-existed and is more than a coincidence it might be used in selecting the animals for injection.

In two cases a single large dose (100 cc.) of hydrocele fluid was injected at once, but no reaction was obtained either the next day or at the end of a week. So that in this way at least the process cannot be shortened.

It was thought that the antiserum might possibly be secreted by the kidneys, and the urine of a highly sensitized rabbit was collected for this purpose. But no characteristic reaction was obtained.

While the operations and reactions are so simple that they can be performed by anyone, still they require care and exactness, and considerable previous practice should be obtained before one would be qualified to testify in a capital case.

In every case of death by violence, where murder is suspected, and there is a possibility of a blood stain having to be examined, a strip of filter paper should be soaked in the blood of the individual at the autopsy. This should be sent to the expert who makes the examination of the suspected blood stain in order that any doubt as to this individual's blood giving a serum reaction can be set at rest.

DISCUSSION.

Dr. E. S. Wood: I should like to say just a word in connection with the title. At the meeting last June I spoke of this test very briefly as the "Agglutination Test." That term I have found by recent study to be improper. The term "Serum Test" is more appropriate. The agglutination test resulted from the experiments of preparing animals by injecting into the peritoneal cavity defibrinated blood, including the red blood cells, which produce in the blood a substance which will agglutinate the red blood cells; but for that test to work it is necessary that there be red blood cells in the suspected stain. That is impossible in testing a great many dry blood stains. I have changed the title of the test, for the purposes of this society, to the "Serum Test for Blood."

Dr. Julian A. Mead: I should like to ask if this test adds anything to the power of the examiner to detect crime? If there might not have been cases that would have been differently decided, if we had known of this test?

DR. E. S. WOOD: It is a very important addition to our means of distinguishing between human and animal blood. At the present time, by the old tests, no hematologist would venture to testify in court positively as to whether a certain blood stain was due to human blood or the blood of certain animals whose red blood cells average the same in size as human blood cells. Take, for instance, the domestic animals; the dog comes nearest to the human in the size of the red blood cells. I have never testified in any case that a given blood stain could not have been that of some animal; of course, the burden of proof is on the defense. By our old methods (without this recent test) we were able to testify that a certain blood stain gave results, on measuring the red blood cells obtained from the stain, which showed that the blood stain was consistent with its having been made by human blood, and further than that I do not know that any expert has ever testified. But now, if we obtain a positive result by this serum test, we can say that the stain contains human blood serum and does not contain that of any other animal except some species of monkey. There are certain wild animals, the seal for instance, whose red blood cells measure the same as human blood cells, but the comparison is usually made only between human blood and that of domestic animals.

The rule has been not to testify to a certainty as between human blood and that of any animal whose red blood cells average more than $\frac{1}{4000}$ of an inch in diameter. Human blood averages $\frac{1}{3250}$, and that of the dog $\frac{1}{3500}$, which is too near to distinguish with certainty between them, some of the smaller human cells coming within the limits of the dog, and larger cells of the dog coming within the limits of the human.

DR. W. F. WHITNEY read a paper entitled

NOTES ON THE PRODUCTION OF THE TEST SERUM IN RABBITS.

DR. B. H. HARTWELL: I have nothing to say in discussion of this question. I wish to move a vote of thanks to the eminent gentlemen who have presented the papers this afternoon, and in doing so, express my thorough appreciation of what they have said, not only of interest to us, as from a scientific aspect of the case, but from the practical good to the commonwealth. We are interested, with the prosecuting officers, in the maintenance of peace, law and order, and this will enable the prosecuting attorney to present to the court the fact whether or not it is human blood, not as they have done heretofore, that it is not inconsistent with human blood; and I offer my congratulations to Dr. Wood as being the first, as he stated, to go before the courts and state positively that a certain blood stain was produced by human blood, and I move, Mr. President, that a vote of thanks of this society be extended Professors Wood and Whitney for their papers.

Above unanimously voted, and meeting adjourned.

A CASE OF POSSIBLE FATAL MORPHIN POISONING; A DIFFICULT DIAGNOSIS.[1]

BY F. A. HARRIS, M.D., BOSTON,

Medical Examiner, Suffolk County, Northern District.

On the 14th of July, 1901, about half past seven in the evening I was notified that there was a case in East Boston which required my official presence. The police, who telephoned me, said that it was a case of poisoning by morphin administered by a person who had no authority so to do. In company with Mr. Samuel M. Child, the assistant city solicitor, I went to the house where the body lay. I received from the police, the members of the family and the physician who was called to attend the woman the following history:

The woman who had died was the wife of the owner, or tenant, of the house, and mother of a family of adult children. Her occupation was housewife and her age about fifty-five. For many years she had been subject to attacks of congestive cephalalgia of great severity, incapacitating her from the performance of household duties temporarily. Otherwise she had had no illness worth mentioning.

It had been planned that the family should pass the day, Sunday, at Revere Beach, and it was proposed that they should start about noon. When the woman, Mrs. E. J. B., arose in the morning she was suffering from one of her "old-fashioned headaches," but attended to her daily avocations in spite of the pain, "expecting that the trouble would wear away." The headache, however, increased in severity. At eleven o'clock she was in great pain. The weather at the time was intensely hot. The mercury had ranged from 85 to over 90° on the previous day and had been but little lower during the night, while there was every prospect that Sunday would be still hotter, and the expectation proved well grounded. The house occupied by the family was a small cottage, almost entirely devoid of shade, and on the south and east exposed to the full power of the sun.

It so happened that the family had had for some time living with them a boarder, of German extraction, who was nominally a broker of some sort; a man who, while not claiming to be a doctor of medicine, claimed to be entitled to use the letters D.M.S. after his name. These letters were understood to mean "doctor of medical science" — whatever that might mean. He claimed to have been a student at a German uni-

[1] Read before The Massachusetts Medico-Legal Society, Feb. 5, 1902.

versity and a graduate therefrom. Now this man, R., had had for years a popliteal aneurism, and for the relief of the pain which this aneurism caused him he had resorted to the use of hypodermic morphin until he had become a victim of the habit. It was stated that on one or two occasions he had administered small doses to young people of the neighborhood, "just to make them feel good." On one occasion, some time previous to the Sunday of which this story is told, R. had with the consent of Mrs. B. administered to her for a similar headache a small dose of morphin, injecting it into the "finger." He was told by the husband never to do it again. That is, such is the statement of Mr. B. Just why he, Mr. B., should have done this is not clear, as she apparently suffered no ill effects from the exhibition of that particular dose.

It does not appear that any doubts as to the sanity of R. were entertained, although his tales of expected wealth from Europe and his propositions to take the whole family to New York and entertain them indefinitely, and other similar things, suggest a possible megalomania. At all events it is undoubtedly true that at times, when under the influence of his favorite drug, he was to a greater or less degree (to coin an expression) megalocephalic.

R. made no secret of his use of the drug. He not only kept the drug in the form of tablets in his room, but also kept his syringe and a solution of the tablets on the mantelpiece in the kitchen and he was in the habit of administering to himself a dose, at intervals, in the presence of the members of the family.

To return to the Sunday in question: As Mrs. B. did not get any better, and the time approached for their departure for the outing [and the statement was made that he (R.) had some objection to the proposed outing, though for what reason was not apparent], R. suggested to Mrs. B. that she take a hypodermic injection of the drug. To this she consented. About this there is no dispute. Accordingly he administered an undetermined amount. This amount will be discussed later.

Approximately a half hour after the exhibition of the drug Mrs. B. is said to have looked "strangely," among other appearances being unusually pale. She was asked what the matter was, and to this she replied, "Oh, nothing; I shall be all right very soon." Her condition did not improve and the family became alarmed. She seemed to be losing consciousness and her appearance was unusual. The husband came downstairs, and observing her appearance asked R. if he had given her any morphin. He admitted that he had. A little later Mrs. B. became unconscious, her breathing rather loud and (apparently, from description) stertorous. Then R. became disturbed and went for a physician. The nearest was a Dr. B., a man who was registered under Grade C by the provisions of the *then* law, which has since been repealed. He responded to the call.

He stated that he found the woman with face "ablaze," her pulse very rapid and her temperature 99° F. Dr. B. diagnosticated opium poisoning, and administered $\frac{1}{150}$ gr. of sulphate of atropia. It could not be learned that he did anything else, although he said that he "worked over her." It does not appear that he used any of the ordinary remedies for opium poisoning, such as the infliction of pain, the use of cold water, artificial respiration, continued motion, or, in fact, anything else except that he gave some extract of coffee. The condition of the woman grew steadily worse and the breathing more and more stertorous, the pulse fell, the temperature lowered, and she gradually sank away and died about six o'clock in the afternoon — say six to seven hours after the administration of the drug. When the Dr. B. was asked as to the various conditions, he did not appear to wholly appreciate just what was meant, and no very clear idea could be formed as to just what obtained between the time of his arrival on the scene at, say 1 P.M., and the time of death. Asked "What was the condition of the conjunctiva?" he repeated the word interrogatively, and then said, "Oh, you mean the *holes* you look into."

The information gained from this physician was on the whole unsatisfactory, but as far as could be learned it seemed that the pupils were unequal, the conjunctiva pale, and there was at no time any dusky purplish hue to the countenance such as is usually observed in cases of fatal opium poisoning.

Next, came the question as to the amount administered. The man R. was under arrest at the time of view, and soon after his arrest, owing to deprivation of the drug to which he was accustomed, was almost in a state of collapse, and any information from him at that time was practically worthless. However, from what he said to the family, the doctor and the police, it appeared that the amount administered was one half a grain or a little more. He was in the habit of buying the tablets of sulphate of morphia, made by Wyeth, of the strength of one-quarter of a grain each. He had a two-drachm vial. He dissolved sixteen of these tablets in the vial full of water. Of this solution he said he administered sixteen drops or minims to the deceased. This would give a solution of two grains to the drachm and the dose given about half of a grain, allowing for a little waste. He claimed that he gave but half of a grain. There was quite a discrepancy between his statements at different times, but on the whole it seemed probable that he gave but little over half of a grain to Mrs. B. The "view" showed this condition: A well-nourished woman, between fifty-two and fifty-five years of age. Rigor mortis commencing. A little lividity of the dependent parts. A very unusual pallor of the whole skin. Indeed, the body, except where the lividity was noted, was almost like alabaster. The conjunc-

tiva marble white. No dusky hue to the skin anywhere. The pupils were equal and dilated. There was a small puncture, a mark like that of a pin or needle on the outer aspect of the right arm. Nothing else unusual.

The undertaker was instructed not to embalm the body, but was told that he might use ice if he wished. This he did not do. Early on the following morning the case was laid before the district attorney, who on review of all the circumstances declined to authorize an autopsy. Thereupon I furnished a certificate of death from "heat exhaustion, combined with hypothetical morphin poisoning."

The man R., who was under arrest, was brought up for trial in the lower court. The testimony as to the amount of morphin said to have been admitted to have been administered, was fixed at a little larger amount than was stated at the time of my investigation, but still not increasing the amount to anything near what is usually considered a fatal dose for a healthy adult. The judge held the man for the grand jury. Before that body the amount of morphia said to have been given was still further increased, according to the testimony of those who had heard my evidence in the lower court. The grand jury found no bill, and the man R. was therefore discharged.

The case suggests several points which seem to me of interest as affecting the action of the medical examiner.

Naturally the first thing requisite in such a case as has been related is to establish if possible what was the exact cause of death. For this purpose the examiner must rely on three things: the history of the case, the appearances at autopsy, and the result of chemical analysis.

As far as the history of the case is concerned the symptoms and appearances observed are consistent with either heat or morphin poisoning unless undue weight be given to the statement as to inequality of the pupils. And while it is a fact that directly after the administration of a large dose of morphin hypodermically, there is great congestion of the face, especially if by mistake the needle is pushed into a vein, yet as far as I know such an appearance is transient and would hardly be expected as late as half an hour or more after the administration. Weakness and vertigo, dimness of vision and loss of sight, loss of consciousness, stupor and coma, stertorous breathing, pupils primarily contracted and later dilated, flushing and pallor of the face are alike observed in fatal cases of heat exhaustion and morphin poisoning. The appearances at autopsy also offer very little which is of value in making a differential diagnosis. These are not constant in either form of death, but in general: dark and fluid blood, congestion of brain, lungs and the viscera in general, dilatation of the right side of the heart, in short, those appearances usually observed in cases of asphyxia are found

in both morphin poisoning and death from heat. Some other things of less consequence reported to have been observed are found in cases of death from either cause.

The chemical examination is also liable to fall short of giving results which would enable an absolute diagnosis to be made in such a case as this, where it is probable that a small amount had been administered. Indeed, it is reported that in none of a very large number of cases occurring in India, where the fact of opium poisoning was undoubted, and where autopsy and chemical analysis followed very speedily and the amount of the drug large and, furthermore, administered by the mouth, was it possible to detect opium. The gentleman, whom I presume we should all regard as the most skilful chemist in New England, tells me that it would be practically impossible to detect the presence of the drug in a case where so small an amount was given as in the case of Mrs. B., especially when given hypodermically, owing to the rapid elimination or change in the body. In this case life was prolonged six or seven hours. Therefore, in view of all these things, the medical examiner is not, after exhausting all the resources at his command, in a position to answer the question "What was the exact cause of death?"

My object in reporting this case is to suggest a discussion as to what the proper action of the medical examiner should be in such a case. Should he perform an autopsy, incur the expense of a chemical examination and put the machinery of the law in motion, or in view of what is probable, should he confine his action to the view and furnishing a certificate for burial.

In order that this matter may be still more clearly appreciated, it is worth while to consider what the outcome would be in case of trial, though legal questions are supposed to be outside the province of the medical examiner, and the object of the law was and is assumed to be a divorce between law and medicine. In this case assume that on the whole the examiner was convinced that death resulted from opium poisoning and should conscientiously testify to that effect. There can be little doubt that such evidence would be pretty successfully contested at time of trial, and he would be obliged to admit that there was at least that reasonable doubt to which the accused is entitled.

Again there comes the question as to who, if any person, is responsible. Is it the man who administered the drug with the consent of the deceased and without intent of doing her harm, but rather intending to do good, though not sufficiently familiar with the effects of morphin to fully appreciate the danger of his act, or was it the man who holding himself out as a competent physician, yet who used none of the well-known methods of treating opium poisoning, such as the infliction of pain, motion, cold douches, artificial respiration, electricity, etc., but

confined himself to the exhibition of a little extract of coffee and the administration of a minute quantity of atropin, whose efficacy is rather a matter of academic discussion than of practical demonstration.

On this point the former attorney-general, Hon. Hosea M. Knowlton says: "Guilt ordinarily can only be predicated upon some form of criminal intent. Familiar examples of this, of course, are assault and battery not intending death; or the extreme but somewhat illustrative example of a man shooting at an animal whose killing is forbidden under the game laws, and hitting a man and causing his death. A criminal act was being done, and while the homicide was not intended it was the result of an act done criminally.

"There is another class of cases, however, of which homicide may be predicated, to wit, those involving carelessness. Familiar examples of these are reckless driving by teamsters, or want of ordinary care by a motorman or an engineer. Another example, which presents a case somewhat similar to this (R.'s), is carelessness in the use of firearms. Ordinarily, mere negligence is not criminal; but there can be such gross carelessness in the use of a pistol or other firearm as to make the negligence criminal if death results. So as to the use of poisons. Mere negligence, and much less, want of skill, in the administration of a poisonous drug is not criminal of itself. But the administration of a drug known to be poisonous, with a reckless disregard of consequences and in such quantities as would to the knowledge of an *ordinary man* be excessive, would be indictable. I do not think your case (the case of R., who gave the drug to Mrs. B.) presents any such situation.

"To sum it all up, death resulting from gross carelessness is a criminal offense. Death from mere negligence, although actionable on the civil side, is not criminal. It is not always easy to draw the line — in. fact, the only tribunal which has authority to draw the line is the jury

"As to the physician. The rule is the same as to this class of people, with the addition of a principle which is applicable to them alone. A physician who holds himself out as competent to administer drugs, is bound to exercise the skill and knowledge ordinarily required of men of his class. You will observe two factors to this proposition: (1) that he holds himself out as a physician, and (2) that he must exercise the knowledge which an ordinary physician ought to have. If therefore an unlearned man pretends to be a physician, he is held up to the same rules as a physician, and if he grossly fails to observes the rules which the ordinary experience and skill of physicians have shown to be necessary, he may be liable criminally. In other words, gross negligence may be predicated of a physician when it could not be of a layman. He is held to the knowledge which he pretends to have.

"There is an another question. That is, how far the negligence of the physician may affect the guilt of the layman who administered the

poison. It has no effect whatever. The guilt of the man is determined by his own conduct, provided death results. If, of course, the death results from the misconduct solely of another person, it is not the killing by the first man, but if the misconduct of the second man contributes, it does not excuse the misconduct of the first man."

Another opinion is as follows: "If there is a legal duty imposed, failure to exercise ordinary care or skill if the result be fatal is indictable. In the case of R. there was no legal duty, but a voluntary exercise of medical science (?) with the patient's consent. I should say, with my present knowledge, that if the person administering the morphia was grossly careless and knew the dangerous property of morphia, that he would be liable. No intent is necessary. The calling in a physician would not change the offense. As to the physician the answer should be that the physician is liable."

As far as I have to learn from a perusal of the "Transactions" of this society, there has never been any entirely satisfactory solution of various ambiguities in the wording of the statute concerning the duties of the medical examiner. I remember at the very earliest times of the existence of this society an opinion was requested of the then attorney-general, the late Charles R. Train, as to the interpretation of certain ambiguous phrases, and that he replied that he had "yet to discover that it was any part of his duty to instruct medical examiners as to the proper performance of their duties," or words to that effect. Owing to my life-long acquaintance with that gentleman, he, however, furnished to me as a personal favor his opinion as to the meaning of the several clauses under discussion, and I reported this to the society at that time, and I have yet to learn that any other interpretation widely at variance with his views has been obtained from any of his successors.

He claimed that the duty of the medical examiner was to investigate only such cases as those where criminal violence was suspected. Again Chief Justice Mellen Chamberlain, one of the ablest judges of the municipal court who have held the office, laid down the rule that "The object of an inquest is not to lay the foundation for the prosecution or defence of a civil suit." As I understand the matter, it was the intention of the law-makers in the enactment of the so-called medical examiner law to divorce as far as possible law and medicine. The case which I have just detailed is one which in my opinion shows the extreme difficulty in accomplishing that supposed object of the law. As before stated, if it were possible to absolutely determine in this case that the death had resulted from morphin poisoning, then comes the question as to the individual responsible. Of course it may be said that is no concern of the medical examiner, but that it is solely the duty of the court. This is true, but before the examiner takes such action as to put the

county to the great expense attendant upon a complete demonstration of the medical facts, if such demonstration be possible, is it not his duty to look far enough ahead to determine if all the labor and expense is to be warranted? If no person can be held responsible, or if a criminal prosecution is more than likely to fail when it comes to the trial in the higher court, is the medical examiner justified in allowing or compelling the county to assume that expense, in a matter resting so largely on his dictum.

In a case like that of Mrs. B., suppose that the results obtained at autopsy are consistent with opium poisoning; suppose that the results of chemical analysis showed that there had been by the most careful estimate a half a grain or even a whole grain of the drug administered, and suppose that the medical expert should most conscientiously testify that on all the facts it was his opinion that the deceased came to her death from opium poisoning, what would be the probable result? It would have to be admitted that the amount assumed to have been administered was below the minimum fatal dose for an average healthy adult. He would be without aid from the chemist in the matter of establishing that a probably fatal dose had been administered. He would be obliged to admit that the history, the symptoms and the results of chemical examination were consistent with either morphin poisoning or heat, but were rather more in favor of death by heat. That at all events, if morphin caused the death, the deceased must have been one of those persons with an idiosyncrasy which he could not have known, nor especially in view of the fact of his having previously given the same woman a hypodermic injection without bad results suspected. This idiosyncrasy might have been followed by startling results had the drug been given by the most skilful physician. All these things would in all human probability have created in the mind of the average juryman that reasonable doubt to the benefit of which the accused is entitled.

It is easy to say off-hand that the obvious thing to do is to lay the whole matter before the district attorney and be guided by his decision. That would be perfectly feasible in counties like Suffolk, where the district attorney or one of the assistants is easily accessible, but I am informed that there are districts — I mean medical examiner districts — when that matter is not so easy and where action by the examiner ought to be taken before the district attorney could be reached.

Another point occurs to me which should have been mentioned earlier to preserve a logical sequence, and that is this: According to the legal opinions cited it is difficult to see why two different persons are not liable to indictment for the same crime, and yet it is hard to understand that the second man should have been an accessory after the fact. If the first man, R., was criminally negligent in giving the

drug, then he is to be indicted for the killing, but also, if the doctor called did not act up to the scientific knowledge which he was supposed to have, then he is to be indicted for the killing, and the act or negligence of one in no way affects the criminality of the other. It seems to me that there would be a very pretty legal snarl in case of such a trial. But still further, assuming that the doctor alone should be indicated, would he not be in position, after the government had put in its case, to claim that the diagnosis was difficult, and he could not absolutely differentiate between heat effects and morphin, believing both to be operative, and therefore he only used such remedies as would counteract the effects of opium while not doing harm, if the case were only one of heat exhaustion, as most of the methods of treatment for opium poisoning would be? My own opinion is that in such a case, although a medical examiner ought not, where it is to be avoided, to attempt to settle legal questions, he would be justified in dismissing the matter with a "view" if he could not readily get the opinion of the attorney general or the district attorney. At the worst his action could later be overruled by either of those officers, and further action taken if they thought that all the labor and expense would be justified by the probable results inasmuch as the presence of morphin could probably be as readily detected a week after death as immediately after.

APPENDIX.

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GUNSHOT FATALITY; SOURCE OF SHOOTING PROVED BY AN EXAMINATION OF AMMUNITION.[1]

BY O. J. BROWN, M.D., NORTH ADAMS, MASS.

UPON the evening of Sept. 28, 1896, I was called by the selectmen of Williamstown to view the body of Benjamin F. Moon, found lying dead in a forest two miles west of the college village. It was a dark night, and we proceeded with lanterns. The body lay in an unfrequented spot, about eight rods from a clearing, surrounded by heavy timbers and dense underbrush.

It was the body of a strong man, about thirty years of age, medium size, five feet seven and one-half inches tall. It was lying on back, head toward west, legs and thighs slightly flexed, the right one most. The right forearm and hand a little flexed. The left forearm and hand lay upon chest. He had on a hat, dark sack-coat, vest, two shirts, socks and congress shoes. Around his waist was a cartridge belt containing a few unused cartridges. A breech-loading shotgun containing a cartridge shell stood leaning against a tree, five feet away from the body. Upon turning the body on side, I found that it was lying in a pool of blood, and an opening about the size of a hen's egg was discovered in his back, a little to the right of the spinal column, and just below the right scapula. It was evidently a ragged gunshot wound. It entered the body in nearly a direct line, deflecting in neither direction. There were no powder marks upon either clothing or body. How did this man come to his death?

A neighbor named Coon, who was present with us, volunteered the following: He (Coon) had called at deceased's house about noon, and between one and two o'clock they started from the house together to hunt squirrels. They kept together until about three o'clock. They had not been separated more than ten minutes when Coon heard the report of his companion's gun, and heard him say, "Oh, dear!" He then hastened toward the spot the sound came from, and found his companion lying upon the ground, in the position described. He got down on his knees twice and spoke to him, but got no reply. He claimed that his companion's gun lay on the ground seven feet away. This, Coon had picked up and placed against the tree. He then ran out of the woods into a clearing and called to a farm-hand, named Donnelly, who was there engaged digging potatoes. Donnelly notified his employer, who drove to the town and notified the

[1] Read before the annual meeting of the Massachusetts Medico-Legal Society, June 10, 1902.

authorities. Coon returned to the body and remained until dark, then came to meet us.

He told others about the same story he told me. He thought Moon must have had hold of the muzzle of his gun, dragging it through the underbrush, and while climbing over a high log, which was near the body, tripped and, as the breech was jerked over the log, exploded the cartridge. It was common, he said, for hunters to carry their guns cocked ready for game. This theory seemed so plausible that no one present questioned it. The location of the wound was such, however, that this solution of the case was to me most unsatisfactory. While not impossible, it seemed very improbable, at least, that Moon could inflict the fatal wound upon himself.

Coon had on a cartridge belt similar to the one around deceased body, and he still carried his shotgun. Acting upon my advice, he gave these into the custody of a constable who was a member of our party. All of the possessions found upon the body of deceased were also placed in the constable's hands for safe keeping.

We carefully identified and marked weapons, belts and cartridges, and the following morning, Sept. 29, an autopsy revealed that death was caused by the gunshot wound, and that no contributing cause could be found. The oval-shaped wound, 1½ by 1¾ inches on the surface, extended nearly through the body. The eight, ninth and tenth ribs were fractured. The pleuræ, lungs, diaphragm and liver were badly lacerated, and a larger portion of the charge had lodged in the heart. Most of the shot were flattened.

Over three dozen of these were secured, and after careful rinsing, to remove blood and serum, were sent by two witnesses to Leaverett Mears, professor of chemistry at Williams College, for weighing. A cartridge from each of the hunters' belts was sent him at the same time. Professor Mears returned the following:

"This is to certify that I have weighed three specimens of shot brought me by Thomas Dumfries and Dr. L. D. Woodbridge, with the following results: One dozen flattened shot (used), more or less abraded, selected at random, 4.4 gm.; one dozen shot, selected at random from a buff-colored, unexploded cartridge, 5.65 gm.; one dozen shot selected at random from a purple-colored, unexploded cartridge, 4.57 gm. The shot in the two cartridges vary greatly in size."

The shot from the purple cartridge (used by Coon) resembled those found in the wound, while those in the buff-colored cartridge (used by deceased) varied greatly. That Coon had shot his neighbor and emphatically lied about it, was very evident.

He was under a close surveillance of officers. The relations between the two men were carefully investigated. They were proven to have been the best of friends. No motive could be found for foul play. Our con-

clusion was that the shooting was accidental and that Coon dare not confess. The court postponed further inquest. Coon was a tenant of his and had worked for him, was poor and had a family, and the judge did not want him imprisoned. He therefore let the matter quietly rest.

Two months later Coon visited me and demanded permission to receive his gun, which was still in the officer's possession. I received him in my private office and acquanited him with my theory of his having done the accidental shooting and, for fear of arrest, telling an unmitigated falsehood. He then broke down completely and, crying like a child, made a full confession, saying he had rather be hanged than suffer the conscious pangs of such secret wrongdoing. No arrest was made. The tender heart of the court allowed the case to rest.

A FATAL CASE OF MANDRAKE POISONING.[1]

BY A. W. BUCK, M.D., FALL RIVER, MASS.

THE rarity of fatal cases of mandrake poisoning is the reason for my reporting this one.

Mrs. M., age thirty-one and in good health, on the morning of Feb. 7, 1902, asked a neighbor for some laxative medicine. The neighbor took from an unlabeled paper bag a teaspoonful of what she supposed to be compound licorice powder. This was mixed with a little water, and Mrs. M. drank it. She then (this was at 8.30 A.M.) ate a little breakfast, some egg and bread, but was soon seized with vomiting and purging. A doctor was sent for, who did not see her until 12.30 P.M. Meanwhile the vomiting and purging had continued. The patient had complained of feeling chilly and had gone to bed. Her condition, however, did not alarm her physician, who wrote a prescription calling for a small amount of bromide of soda, bicarbonate of soda and syrup of ginger, to be given in a little water, and left directions that he should be called if she was any worse. Mrs. M. took three doses of this prescription and then appeared to be resting quietly. Vomiting and purging stopped at 2 P.M. Her friends noticed that she appeared drowsy and somewhat difficult to rouse, but thought she was doing well. She continued to sleep quietly through the night, but at 7 A.M., finding that she could not be roused, the physician was again summoned. When he arrived at 8 A.M. the patient was dead.

Subsequently the powder was recognized as mandrake. Another similar bag contained compound licorice powder. No autopsy was made, because of the opposition of the family, and the recognition and acknowledgment of the accidental administration of the drug.

When I viewed the body at 9.30 A.M., Feb. 8, it lay in a position of repose. Pupils moderately dilated. Rigor mortis not present.

I regret that I am unable to give more accurate account of the symptoms, the only prominent features of which (and these I believe to be characteristic) were the vomiting and purging, their cessation with the approach of coma, deepening coma,— without stertorous breathing,— and death.

[1] Read before the Annual Meeting of the Massachusetts Medico-Legal Society, June 10, 1902.

POISONING OF THE UNDERWOOD FAMILY BY WOOD ALCOHOL.[1]

BY E. G. HOITT, M.D., MEDICAL EXAMINER, MARLBORO, MASS.

AT 4.30 P.M., Feb. 13, 1899, while one of the worst blizzards of which our New England climate can boast was in progress, I received a summons by telephone, from one of our shoe manufacturers, that in a little house in the rear of his factory a caller had discovered that four of its inmates lay dead on the floor, and others, three in number, were partially unconscious.

In company with the city marshal and one of his force I went immediately to the place and found four dead bodies lying on mattresses on the floor. The bodies, partly dressed, were identified as those of Edward L. Underwood, head of family, aged forty-eight; his daughter, Frances, aged eight years; a daughter Olive, aged twenty-two years. Beside her lay her illegimate child, John Clifford, aged two years. The bodies were lying in a natural position; the *rigor mortis* was well developed. All had appearance of having been dead several hours.

I found in an adjoining room Mrs. Adelia Underwood, aged forty-four, wife of Edward, mother and grandmother of deceased children, her son Guy, aged eleven, and one Robert McMullen, not a member of the family but a frequent caller at the place. All seemed in a dazed condition.

Mrs. Underwood made the statement to me that she was afraid that other members of her family, in the adjoining room, were going to die. She afterwards admitted that she was aware they had been dead since early morning. When asked why she had not notified some one of the fact, she said "she did not know."

I asked Robert McMullen his name. He replied, "It was none of my business." When asked what he was doing there, said that was his business. I also inquired if he was aware there were dead bodies in the adjoining room. He replied, "What of it?" and "What are you going to do about it?"

When asked if he was acquainted with me, said, "No, and did not want to be."

Guy, the boy, stated that none in the house had previously been sick; that all retired the night before, upon the mattresses, in the following order; First, his father, next to him on his left was himself, on his left lay his mother, next Frances, then Olive, and by her side her baby.

[1] Read before the Massachusetts Medico-Legal Society, Oct. 1, 1902.

He said that McMullen slept on a lounge in the adjoining room. He (Guy) said he awoke about midnight and all seemed to be asleep, the house was warm, saw no smoke and detected no odor. Said his mother soon awoke and gave them all some tea to drink, but was not positive it was tea, that she also drank of the same, but not from the same cup. Said his mother gave him some tea the night before, which he vomited, and that he did not vomit prior to taking the tea. Said all of the family drank liquor, and that they gave it to the baby also. He said he awoke at 9 A.M., Feb. 13, and thought his father was dead, and so informed his mother, who made no reply, but went out of the room. He then told McMullen, who came in and looked at them, said he did not believe it. He also went out of the room.

He next learned that little Johnnie, Olive and Frances were dead, and so informed his mother, who attempted to give them some tea, but was too nervous to do so. Said Miss Lillian Clark called in the afternoon to see Olive, and his mother would not let her in, but told her that she had gone to work — said his mother told him to keep still and say nothing.

I ordered the dead bodies to be removed to the city morgue, McMullen to be taken in custody, and placed Mrs. Underwood and her boy Guy under the care of the city physician at police station.

I made an autopsy on Miss Olive, in presence of Drs. C. L. Cutler and P. J. Dervin. The body was clothed in chemisette, dress waist and pair of black stockings. There was partial *rigor mortis*, lips and tongue were pale, latter forced against teeth, pupils equally dilated, white froth was oozing from nose and mouth, abdomen large and distended, as though containing foreign body, thumbs flexed on palms of hands, fingers flexed on thumbs. There were no marks of violence on body. The brain was normal in appearance, left lung adherent to diaphragm, otherwise both lungs normal. Pericardium contained about one drachm of yellow serous fluid; heart normal in size and weight; anterior and posterior walls of stomach were congested, also upper part of small intestines. Stomach contained about eight ounces of fluid and some solid particles of undigested food — transverse colon markedly distended with gas and very much congested. Gall bladder contained half an ounce of bile. Liver, kidneys and bladder were normal. Uterus contained eight-pound female child, in eighth month of development.

I will here state that from good authority I learned that two years prior to this circumstance, she (Olive) gave birth to a full-term child, which was drowned in a pail of hot water, with her mother's assistance.

I then made autopsy on body of Edward L. Underwood, father of Olive, aged forty-eight years. Body was clothed in black vest, brown flannel outside shirt, light brown undershirt, dark pants, underdrawers, one black stocking on left foot, none on right. There was partial *rigor mortis*, face pale, pupils equally dilated, lips and tongue livid. I found liberally distrib-

uted on body pediculi capitis, vestimenti and pubis. Penis was bandaged with white cotton rags, which contained gonorrheal discharge, with some oozing from meatus. Brain was normal in appearance, both lungs normal. Pericardium contained about two drachms of yellow serous fluid. Heart was abnormally large, right auricle, right ventricle and left auricle distended with dark fluid blood, left ventricle empty. Otherwise heart appeared normal. Anterior wall of stomach and piloric end of same, also small intestines, showed inflammation. Stomach contained about six ounces of fluid, no solid particles of food. Bladder distended and contained about one pint of urine. All other abdominal organs appeared normal.

Following this I made autopsy on body of Frances, aged eight years, daughter of Edward. Body was clothed in corset waist, white ribbed undervest and drawers and black stockings. There was dark fecal matter on nates, seat of drawers and back side of undershirt. Face was pale, eyelids partially open, pupils unequally dilated, lips and tongue livid. *Rigor mortis* was entirely absent. Both pleural cavities contained about four ounces of serous fluid; lungs were normal. Pericardium contained about one ounce of fluid; right auricle distended, right ventricle partially distended with dark fluid blood, left auricle empty, left ventricle fully distended. Heart was normal in size, weight and appearance. Stomach appeared normal, and contained about five ounces of fluid. Small intestines were slightly congested. Bladder contained about one ounce of urine. Liver was normal in size, weight and appearance. All other abdominal organs were normal.

Lastly I made autopsy on body of John Clifford Underwood, aged two years, illegitimate child of Olive, whose autopsy has been previously reported. Body was clothed in dark flannel dress, white undervest and drawers, cotton diaper, containing fecal matter and urine, chest protector, string of Job's tears beads on neck, no shoes nor stockings. Left cheek, nose and forehead were ecchymosed, pupils equally dilated, lips and tongue pale. Each pleural cavity contained about three ounces of amber-colored fluid. All thoracic organs appeared normal. Stomach was distended with gas and slightly congested on anterior surface; contained about four ounces of liquid, no solid food. Gall bladder contained half a drachm of bile. All other abdominal organs appeared normal. Bladder was empty. After making autopsies on all the bodies I removed from each subject the stomach with contents, portions of intestines, liver and kidneys, and sent same under seal to Dr. Edward S. Wood for his examination.

He reported to me that his analyses of contents of all stomachs revealed wood alcohol in sufficient quantity to produce death.

Later on I learned that it was an established custom of this family to drink anything of an intoxicating nature, and that it was freely given to

the younger children. A day or two before their death Miss Olive stole from the factory in which she was employed a quantity of wood alcohol.

Mrs. Underwood, the wife, mother and grandmother, was under the city physician's care for several weeks, in a critical condition, but made a good though slow recovery.

Last month she died at the poorhouse, from a complication of diseases unknown to the writer. Thus ended this branch of the Underwood family, aside from the boy Guy, now fourteen years of age, who gives promise of following in the footsteps of his degenerate family.

DISCUSSION.

Dr. S. W. Abbott: The people that die from such causes are most all tipplers. There are not many people who drink intoxicating liquors, except those, who will take pure alcohol, unless they are the pretty decided tippling class.

Now, wood alcohol, a bottle of which I hold in my hand, has been purified to take the color out, and in all appearances it is the same as pure alcohol. It is not to be taken internally, and is marked on the bottle, "Must not be taken internally," but a great many people cannot read and write, and this is the class that drink it. It should have a good, big red label, marked in large letters, as all poisons, and the red label has come to be the label pretty well marked for poisons. Dr. Draper has enumerated a list of twenty or thirty poisons, but wood alcohol is not among them.

Dr. A. E. Paine: Has not wood alcohol the odor of creosote?

Dr. S. W. Abbott: It is more pungent than creosote, and does not resemble it.

Dr. S. D. Presbrey: I am happy to say that my experience is extremely limited. I do not know that I ever saw a case of illness, or a case of death, from the use of wood alcohol. If I have, it has gone by me without my appreciating it. I have heard of tipplers using wood alcohol, but, as has just been said, they are those who are so thoroughly addicted to stimulation that almost anything would do that was a stimulant, and almost anything is "fish for their net" if it is alcohol.

I have heard that some of the large manufacturing concerns in Taunton, where the hoisting jacks are used, with wood alcohol instead of water, to raise large bodies, have had great trouble by the men tapping the pump and taking out the alcohol. Some had to substitute something else, so that it could not be considered palatable. But those who are so fond of intoxicants often care less about the palatableness than the stimulation. My experience as a medical examiner is purely nothing. I have learned to-day more than I have ever known.

Dr. S. W. Abbott: It seems to me that there is something in the specific nature of wood alcohol that is more poisonous than the degree of poison — something more specific than the degree of poison. It seems to me that

the sweeping character of these deaths in Dr. Hoitt's paper, and the three in Beverly who were all killed by it, would indicate this.

DR. A. E. PAINE: Would like to ask Dr. Hoitt if, in making the autopsy, he did not discover the odor of wood alcohol?

DR. E. G. HOITT: I would say that on the first autopsy that I made I detected the odor but of course that was not positive as a cause of death; so far as I could see this was the cause, and so I sent the parts to Dr. Wood with a report of the case, and he had every reason to believe that wood alcohol caused the deaths. The condition of the stomachs, I would say to Dr. Presbrey, was normal. In the stomach, where they have been on a long tipsy, you would see a slight congestion of the cells. The confirmed drunkard will drink anything. This family was educated to it, even to the baby, two years old. They gave it to him every time that they took it. In this particular case they had been drinking freely, as there had been a lull in the shops. They ran out of money, and finished up on wood alcohol, as they could not get anything from any one. I do not know how much they drank, or how much was stolen; she got it once in a pitcher and once in a bottle. I found a five-pint bottle that had contained wood alcohol, and that was also sent to Dr. Wood. I had no knowledge of how much each drank, or which one died first.

I thought that it was an interesting case.

DR. A. E. PAINE: I was with Dr. Holmes just after the making of wood alcohol started in an adjoining town. Two fellows, working in one of the shoe factories, took one or two quarts home into the town of Avon or East Stoneham. They died within twenty-four hours. Dr. Holmes made the autopsy; the odor was very perceptible through the abdomen and in the urine, and there was a congested condition of the stomach.

The man who ran this wood alcohol place, who is now connected with a large establishment in Buffalo, had suffered from cystitis; he was very sick; he said (this was after these men died) he thought that it was the result of the wood alcohol. He tells me since that it is a common occurrence for the men working over it, or working at it long, to have an attack of cystitis.

DR. B. H. HARTWELL: I am very glad that we have this article to examine, and also that the matter has come before the society. The increasing use of wood alcohol leads us to think that we may have our attention called to it more than in the past.

I called on one of the large furniture finish places and inquired as to the use of wood alcohol in the arts, and I was told that they are using it very much more than in the past. The common alcohol sells for $2.75, and the wood alcohol for only 75 cents per gallon. It smells and is sweet, the same as common grain alcohol. . . .

There was an instance of poisoning from shellac in the Foxboro Hospital, as under these conditions wood alcohol is used in shellac, and it will do just

as well as the grain alcohol. The superintendent had it under lock and key. The patients in using this shellac, as the trustees were having some painting done, were told of its poisonous character by the superintendent, but they thought that he told them that to keep them from drinking it. You know, workers in shellac precipitate it by pouring water into a tumbler with some shellac, thus making a gum, and then drinking the water. Knowing this habit of shellac workers, he told them of its poisonous character; nevertheless, they took it, and two died. That fact was new to me, that shellac workers or finishers knew of this way of getting drink at the expense of the owner of the shellac, by diluting it with water.

Dr. A. W. Buck: I had a case last March of a man forty-four years old (I have the notes here in my pocket). He was not working for two weeks, and was in the habit of drinking. On Sunday (this was on a Monday), he drank from an eight-ounce bottle full of liquid, and drank the entire contents, in small portions through the day, thought to be methyl alcohol, which had a red label on the bottle marked "poison." The son had bought some furniture of a mechanic, and had this bottle full of wood alcohol, to use on it, hid in the closet. The man gave his wife some of the alcohol, saying that it was good liquor, but she refused to drink it, saying that it was not good. His son George called his attention to the red label marked "poison," and he said that the labels were simply a bluff. I do not know how long after he drank before he died, but this man drank all day Sunday in small quantities through the day. Monday morning, when he awoke, he complained of not feeling well, but did not care to have the physician called then; he felt as if he were going blind, the son said he complained of blindness, and he walked about feeling his way all morning; he lay down about twelve o'clock, and spoke at that time, and then died about one o'clock. There was no autopsy; the man drank from a bottle which had a red label, which goes to show that although even with the red label it does not seem to protect the public if they care to poison themselves.

I knew of a case like the case at Foxboro — poisoning by shellac. The results were almost identical with this case reported to-day. As I understand it, the shellac gives up the wood alcohol in it.

Dr. Mead: Simply to swell the list I will mention two cases, painters. They drank about a quart of wood alcohol, as near as I could learn in questioning about the cause of death; there was no autopsy. This happened about five years ago, in the city of Newton.

WOOD ALCOHOL POISONING.[1]

BY S. W. ABBOTT, M.D., NEWTON, MASS.

SEVERAL months ago some deaths occured in Beverly from alcohol poisoning, and as they appeared to be of an exceptional character I wrote to the Board of Health of that city, asking for more definite information in regard to them. It appeared from the reply which was received that three men had drank freely from a bottle marked "*Colonial Spirits*," and all of them had died soon afterward. I then sent to one of the department stores in Boston and obtained an unbroken sample of the same article, submitting it to a chemist, who, after analyzing its contents, pronounced it to be "wood alcohol." The same article is now being sold under several different names. Deaths of this character appear to be on the increase, and some sort of legislation seems necessary to prevent their occurrence. The only measures which occur to me at present as practicable are the requirement that all retail packages of wood alcohol sold under any name shall be very distinctly marked or labeled as poisons, and also the requirement that such articles shall be deemed to be poisons, and shall be sold only by a registered pharmacist, and then only when a record of the sale has been made.

There is, however, a possible difficulty in obtaining such legislation in the interest of public safety, since the patent medicine trust has a well-organized lobby, always watchful against any interference which may be opposed to its financial interests. The grasping spirit of "Commercialism *versus* the Public Health and Safety" has defeated many a life-saving measure in recent years.

A word about alcohol poisoning in general. There seems to be a kind of popular sensitiveness in the matter of calling alcohol a poison. Whatever doubt exists relating to the question of the food value of alcohol, there can be little doubt in the minds of medical men as to its poisonous qualities. It is not necessary to shut a man up in a box and feed him on alcohol for a week in order to settle this phase of the question. We need only refer to the highest medical authorities upon poisons, and upon forensic medicine. Orfila, Christison, Taylor, Tardieu and Boehm all agree as to the poisonous qualities of alcohol both in the production of acute and chronic poisoning, and Caspar, Lehmann, Beck and Woodman and Tidy treat of the medico-legal side of the question. The excellent paper read before this

[1] Read before the Massachusetts Medico-Legal Society, Oct. 1, 1902.

society by Dr. Sabine of Brookline upon the same subject gives ample proof in the same line of inquiry.

A few years ago I had the curiosity to select from all the medical examiner returns for one year every case in which the medical examiner had reason to believe that the death was due either directly or indirectly to alcohol. The whole number was 235 out of a total of 1,651 from all causes returned by the medical examiners, or over 14% of the whole number returned, including homicides, suicides, accidents and deaths by other causes. Among these latter were many from acute alcoholic poisoning (see Registration Report for 1888, p. 399).

If wood alcohol were to come into very common use, and be sold as freely as ordinary groceries or other commodities, without any legal limitation, it is probable that such deaths as have been reported to-day would become of more common occurrence, and action would have to be taken for their prevention.

DEATH FROM A SINGLE VAGINAL DOUCHE. REPORT OF TWO CASES.[1]

BY G. DE N. HOUGH, M.D., NEW BEDFORD, MASS.

CASE I. Mrs. J., aged thirty-three. On Monday, March 10, this woman, who was between three and four months pregnant, miscarried. The next morning she was given a douche of 1 to 1,000 corrosive sublimate, one quart. There is some doubt as to whether she received any more douches. On Thursday, March 13, her tongue was greatly swollen, mouth extremely sore, she was salivated and had a severe diarrhea. The whole mucous lining of the mouth became gangrenous, and towards the end of her life, the sloughs having separated, quite profuse hemorrhage took place. Diarrhea continued, apparently but little influenced by medication, and she finally died of exhaustion on March 26, fifteen days after receiving the douche. The autopsy showed numerous small ulcers in the ascending and descending colon; kidneys half as large again as normal; the uterue contained a soft adherent spherical mass, as large as half a hen's egg, which appeared to be a placental fragment, and which was proved to be such by microscopical examination.

The microscopical examination confirmed the naked eye diagnosis — ulcerative stomatitis, ulcerative colitis and acute parenchymatous nephritis. The bichloride douche was given by her grandmother, an old negro nurse thoroughly accustomed to administering douches, who was, at the time that I talked with her, not absolutely certain but was strongly of the opinion that she had given the girl but one douche.

CASE II. Mrs. S., aged thirty-five. Sarcoma of the uterus.

Vaginal hysterectomy was performed on April 3, 1902. The patient was in poor general condition before as well as after the operation. On April 6 the vaginal gauze was removed, and a douche of peroxide of hydrogen was given. The following day the packing of the vagino-peritoneal wound was removed, and a douche of a dilute formalin solution was given. It was impossible to ascertain the exact strength of this solution. It may have been as strong as 1 to 1,000, or it may have been as weak as 1 to 5,000. The douche caused the patient severe pain, and soon after it was given she passed into a condition of collapse, and in spite of vigorous stimulation died in a few hours.

A careful autopsy was performed, and absolutely nothing was found to account for the death. I believe that the irritant action of the formalin

[1] Report to Massachusetts Medico-Legal Society, Feb. 4, 1903.

on the peritoneal surface (there can be no doubt that the formalin solution penetrated to the peritoneal cavity) caused the pain, and pain so severe that the patient, in her weak condition, was thrown into the condition of shock from which she died.

APPENDIX.

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Thomas M. Durell, M.D.	1890-1893
F. W. Draper, M.D.	1893-1896
J. A. Mead, M.D.	1896-1900
F. E. Jones, M.D.	1900-

TREASURERS.

Robert Amory, M.D.	1877-1879
C. C. Tower, M.D.	1879-1893
A. E. Paine, M.D.	1893-

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HISTORICAL NOTES ON THE LAWS GOVERNING CIVIL MALPRACTICE IN THE ANCIENT TIMES AND THE MIDDLE AGES.[1]

BY CHARLES GREENE CUMSTON, M.D., BOSTON.

THE question of civil malpractice is of interest to both the medical and legal professions, and of recent years many rather unusual cases involving medical liability have been tried in various courts of the United States. That the physician and surgeon have been held liable for their actions by the courts of justice is as old as law, and it occurred to the writer that publishing a few scattered notes he had made on the history of this subject might not be without interest, although he must concede that the question consigned in the following pages is only superficially discussed.

Among the Egyptians the law punished very fully any too imprudent or audacious physician, and in the seventh volume of his "*Histoire de la Legislation*" De Pastoret says that "general rules had been established for the treatment of patients. These were the result of carefully made observations which were guarded by the priests in books that were so respected that they were solemnly carried in the processions taking place on days of public fête. An absolute prohibition did not exist preventing a physician from applying a new truth, but if, far from obtaining the salutary effects that he expected to procure he caused the death of his patient, he was obliged to pay his tribute for the misfortune or the boldness of having sacrificed the life of a citizen, by being beheaded. On the other hand, he was never liable to a patient confided to his care when he followed the rules laid down in the sacred books."

The same authority says that the Greeks also admitted medical liability, and Tourdes quotes an example related by Plutarch of a certain physician of Ephesus, by name Glaucus, who, having left his patient to go to the theater, was condemned by Alexander to be put to the cross, because the patient, having imprudently eaten during his absence, died.

In Roman law the principle of medical liability was admitted, and this is proof positive since it is so formally stated in the old texts. This can easily be understood, since at Rome any one could practice

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medicine who so wished, and, generally speaking, the slaves practiced the healing art, which was a source of large income for their masters. These physicians, or perhaps it were better said empirical practitioners, had no other end than the gain of money, and there was, consequently, a double motive for making them liable for mistakes committed in the exercise of their practice. On the one hand, there was no guarantee offered by a diploma attesting to serious studies and a certain science, while on the other, there was a complete lack of devotion and scientific disinterestedness.

A physician who gave his services to a patient was responsible to the master if the latter were a slave, and he fell under the jurisdiction of a suit *lege Aquilia*, or under the application of suit for the hire of labor. The first clause of the law Aquilia covered in point of fact by those cases where another's slave had been killed without right. It was quite sufficient that a slave had been mortally wounded. The physician who, after having operated upon a slave, abandoned the after care and allowed him to die was at fault according to the terms of the law which ran as follows: " Præterea si medicus qui servum tuum secuit, dereliquerit curationem, atque ob id mortuus fuerit servus, culpæ reus est." [2]

There was also error on the part of a physician who by ignorance killed his patient by administering a medicine *mal à propos* and which caused the latter's death, as the following text shows: " Imperitia quoque culpæ admuneratur; veluti si medicus ideo servum tuum occiderit quod cum male secuerit aut perperam ei medicamentum dederit." [3]

Wounds which were not fatal but which were sufficiently serious to be damaging to the master of the slave were comprised in the third clause of the law Aquilia. The direct application of the law Aquilia was only allowed when the detriment resulting was caused *corpore corpori*, for example, when it was applied to a physician who had wounded or killed a slave by the performance of an operation upon the latter. But it was not applicable to the one who had only been the cause of the detriment, and who had not caused it by his proper body, as, for example, a physician who had prescribed a medicine *mal à propos*. In this case the *juris consulis* gave the application to the law, that is to say, introduced by interpretation, following the example of that of the law and procuring by the manner in which it was drawn up by the pretor the same results.

According to Accarias the professional services of a physician could become the object of a hire of labor when it was a question of a slave,

[2] Instit. Liv., iv, tit. iii, § vi.
[3] Instit. Liv., iv, tit. iii, § vii.

and Proculus declared that a physician who had badly cared for a slave could be sued either *ex lege Aquilia* or *ex locato.* The following is the exact text: "Proculus æit, si medicus servum imperite secuerit, vel ex locato vel ex lege Aquilia competeri actionem."[4]

The direct application of the law Aquilia could not be applied to a physician when the victim was a free man, and Ulpien says that "a man has not the right of ownership of his limbs." Now, in order to obtain a direct application of the law Aquilia, it was necessary that the person injured should have also his patrimony involved. But a free man who had become the victim of errors committed by a physician could have the direct application of the law Aquilia accorded by the pretor who procured the same effects, excepting in that which concerned the pecuniary reparation of the injury. In the latter case the value of human personality was not considered. The reparation could only include the tort resulting from expenses involved for the cure, from incapacity to work, and, lastly, the funeral expenses.

Now, although the texts are perfectly affirmative regarding the admission of the principle of medical liability in Rome, it is more difficult to say whether or not it was frequently applied, and it would appear that the contrary was more likely the case if one considered with what violent indignation Pliny affirmed that in Rome a physician enjoyed the most complete impunity as he states in the 29th book of his "Natural History," as follows: "Nulla præterea lex, quæ puniat inscritian; capitale nullum exemplum vindictæ. Discunt periculis nostris, et experimenta per mortes agunt: medicoque tantum hominem occidisse impuniter summa est. Quin imo transit convicium et intemperantia culpatur: ultroque qui periere arguuntur."

The Roman laws were not, however, as severe as Montesquieu has upheld in his immortal work entitled "*Esprit des Lois,*" in which he says "that the people were desirous of having physicians punished for their negligence or their ignorance. In this case they condemned a physician who occupied a certain social position to exile, while death was the sentence applied to the one occupying a lower social condition." This great writer committed an error, for the law to which he makes allusion,[5] "*Ad legem Corneliam de Sicariis . . .,*" did not punish negligence, ignorance or lack of attention, but the *crime,* the grave mistake committed with the criminal intention of producing death.

Medical liability was rigorously followed out in the ancient Germanic law, to such an extent that before undertaking the cure of a patient the physician was obliged to give a security in order to guar-

[4] D. Liv., ix, tit. ii, vii, § viii.
[5] D. iv, iii.

antee the indemnity in case he was unsuccessful. A physician who while bleeding a free man wounded him, was obliged to pay his family a compensation of one hundred and fifty ducats in gold. In case of the death of the patient, the physician became the property of the family, who could use its right of vengeance as it saw fit. "Si quis medicus, dum fleotomiam exercet, ingenuum debilitaverit. CL solidos coactus exolvat; si vero servum hujusmodi servum restituat (in lege Ervigiana post exolvat leguntur: si vero mortuus fuerit proprinquis continuo tradendus est ut quod de eo facere voluerint habeant protestatem)."

A physician could not bleed a free woman unless her husband or some of her near relations were present, because the law said: "Difficillium non est sub tali occasione ludibrium interdum adscrescat."

In Beugnot's edition of the "*Assises de Jérusalem*" will be found many important remarks regarding the liability of physicians in the middle ages.[6] A physician called to attend a serf, and by his ignorance causing the death of his patient, was condemned to pay the value of the serf and was obliged to leave the city, and I here quote an interesting paragraph:

" C'il avient par aucune mésaventure que je naffre un mien serf ou serve, ou aucune autre personne le naffre, et je i amène un meige et celui meige s'accorde o mei a pris noumé et me dit au tier jor, puisqu'il ot bien veu la plaie, que bien le garet sans faille; et il aveint puisque il le tailla malement ou por ce que ne devet étre taillé et il le tailla et porce il mourut et porce que it devet tailler la blaie par la levure et l'apostème donc et il le tailla de travers et por ce mourut: la raison juge et commande en ci a juger que celui meige doit amender le serf ou la serve par droit tant comme il valait au jour qu'il fut naffré, ou tant comme l'acheta celui de qu'il estait car c'est dreit et raison par l'assise. Et deit la cort celui meige congeer de la vile ou it fist cele mauvaise megerie."

According to this text the physician after having seen the wound promised to cure the patient, but following a badly conducted operation which resulted in the death of the patient, the physician was declared liable for this unfortunate occurrence. The text then goes on so as to cover those cases in which a wound became gangrenous because the physician did not give the patient daily attendance, and it declares the former liable for this accident. In the same way it holds the physician liable for any imprudence committed by the patient, because he did not indicate in what ways the patient should care for himself.

[6] The ideal type of feudal law is that so graphically depicted in the works which pass under the title of the "Assises de Jérusalem," and which profess to describe the usages of that curious product of the Crusades, the Latin Kingdoms of Palestine.

And, lastly, the text speaks of damages due in case the victim was a serf. The physician, after having promised to cure him, employed bad drugs and did not succeed in his object. The patient was maimed forever. The physician was obliged to take the serf for himself and to pay to his master the sum that the serf had cost him. In case the physician could not pay the entire sum, he was obliged to leave the serf with his master and only pay " celui serf ou cele serve vaura de mains por ce qu'il est mahaignes par sa coulpe."

When the victim was a free man the liability of the physician was very much greater. If it were a question of simple wounds or of bad treatment which did not cause death, not only the physician had no right to demand any fee but he had his right hand cut off. In case of death of the patient the physician was condemned to the gallows: "Mais se il avet se mahaign fait a un crestien ou a une crestienne, la raison juge qu'il det predre le poing destre et ne det plus estre damages for tant que c'il avet rien pris de celui por le meger si est tenus dou rendre par dreit. . . . Et se celui miege avet anci malement mege come est dit dessus aucun franc home ou aucune franche femme et elle en moret la raison juge que celuy meige det estre pendus et . . . it a det estre dou seignor par dreit. Mais ce il avait riens receu dou mort si det estre rendu as parens dou mort des choses dou meige car ce est raison et dreit."

The text adds that before being put to death the physician should be taken through the streets of the city in order to serve as an example to his colleagues.

It happened that, on account of fear regarding their liability, physicians refused their services to patients, or if they gave them they demanded a guarantee releasing them from any responsibility should the case terminate unfavorably. Guillaume de Tyr tells us that Amaury I, feeling that his strength was leaving him, demanded medicines from some Syrian physicians. These they refused, and he was only able to obtain them from the Latin physicians after he had given his promise that they need not be disturbed, no matter what issue the disease might take.

In the ancient French law the liability of physicians and surgeons was distinctly held. Denizart established a hierarchic difference between physicians and surgeons, and declared that the latter were subordinate to physicians. He admitted the liability of surgeons and declared them held for tort towards those they might maim by their ignorance, and attributes to physicians the power of examining the facts of the case in order to ascertain whether the surgeon was reprehensible or not. He goes on to say that: "When a surgeon has conducted the case according to the rules of his art, he should be paid

for his operations and for his care and dressings, although the patient may have not been cured, even if one was obliged at a later date to do an amputation of some fractured limb, the cure of which the surgeon had undertaken."

Efforts were made in France by Charles VI, Henry IV, Charles VII and Louis XIV to formulate laws to control the practice of surgery, but these were apparently only partially successful. It is not without some interest perhaps to add that, as far as I have been able to discover, Henry IV of France was the first to create what would at the present time be called a medico-legal expert. These experts were selected from among the most capable surgeons. It is also positive that about the middle of the sixteenth century certain cities appointed what might be termed expert surgeons, for the purpose of examining the wounds of patients seriously injured, and to see that the attending surgeon treated the case properly; for otherwise the patients could bring suit for tort should it be shown that there had been malpractice. That this is a fact will be found from the following quotation that I make from the treatise on surgery by Felix Wurtz, a noted surgeon of Basel, whose fame was widespread at about 1560:

" Un Chirurgien ne doit point permettre à un chqun de voir, ou mettre la main aux blessures de ses patiens, ce que neantomoins plusieurs ont accoustumé de jure. Ce n'est pas que je oeuille blasmer la couterme de plusieurs Villes bien policées, où les Magistrats font ordinairement visiter une jois, ou deux, touttes les blessures considerables, par les Chirurgiens jurez; au contraire, je soustient qu'elle est extremement necessaire et qu'elle se devroit establis par tout, enfin que si quelqe'un est malpensé, ainsi qu'il arrive assez souvent, il en puisse pacie ses plaintes à la Justice."

The mistakes committed in the rules of practice should be appreciated by men engaged in that profession, and Denizart quotes a judgment which acquitted a surgeon who was accused of having given bad treatment, only after having heard the testimony of expert surgeons. The case was as follows: A surgeon sued a patient, who had a broken arm, for the payment of his fee. The arm had either been set badly or too early and, having been inconsiderately moved by the patient gangrene appeared. The patient refused to pay the bill. The court then ordered some expert surgeons to examine the question as to how the accused had acted and if the operation and his dressings were in conformity to the rule of his art. After having heard the declarations made by both the surgeon and the patient, they returned a verdict in favor of the surgeon, and as a final consequence the court ordered the patient to pay the surgeon's fees. This

same writer mentions another case where the surgeon was sued in the criminal court and was condemned to pay fifteen thousand pounds damage and interest, because the ignorance of the surgeon was proven by the findings of the experts called in on the case.

Charondas, a well-known lawyer who flourished in the middle of the sixteenth century, said that a surgeon was liable for accidents which might occur to his patients if they came from his mistake. He mentions a case of a surgeon who was taking care of a patient afflicted with a venereal ulcer, but an accident occurred during the treatment which caused the death of the patient. For this mishap the surgeon was brought to justice as having been the cause of the death. Charondas during the trial held that since neither deceit nor ignorance on the part of the surgeon could be shown in the treatment employed for the cure of the ulcer, the surgeon could not be held responsible for the accident which occurred later.

Papon, a well-known judge who lived during the regency of Catharine de Medicis, says, that although a patient may die, the physician should not be held liable unless he was found ignorant or too hardy in his treatment, and that consequently a legal examination should be held in order to ascertain the true circumstances of the case, and if the physician is found to have committed a mistake he should be punished by the courts. This same author then relates the case of a physician who gave a potion to a patient which was either capable of killing him or saving him in a very short time, and the patient died from its effects. The physician was, however, easily acquitted, but he was admonished by the court never to repeat the same treatment again under penalty of being severely punished.

Jean Duret, a physician of some note who lived during the last half of the sixteenth century, declared that a physician was liable if he showed himself an idiot in both the theory and practice, or if he showed himself too audacious, and Raymond de l'Eglise upheld that a physician was liable not only for his temerity and his neglect of a patient but also for his ignorance as well. Brillon, whose classical dictionary was published in 1711, also upheld that physicians were liable for their acts. He based his opinion on Papon and another writer, who declared that a physician was liable either for a slight mistake or a very slight mistake, and he relates several judgments in which the principle of medical liability is upheld.

The public was far better protected against nostrums and quacks a few hundred years ago than it is at the present time, as will be seen from the following: In the reign of Edward VI, Grigg, a poulterer in Surrey, was put in the pillory at Croydon and again in Southwark, for cheating people out of their money by pretending to cure them

by charms, or by looking at them, or by casting their water. Many other quacks have at various times been subjected to punishment. Anthony was punished for his Aurum Potabile; Arthur Dee for advertising medicines to cure all diseases; Foster for selling a powder for the cure of chlorosis; Tenant, a urine caster, who sold pills at six pounds apiece; Aires, for selling purging sugar plums; Hunt for putting up bills for the cure of diseases in the streets. The council in the reign of James I dispatched a warrant to the magistrates of the city of London to arrest all reputed empirics, and cause them to be examined by the censors of the Royal College of Physicians. Several were arrested and acknowledged their ignorance. In the reign of King William a certain Fairfax was fined and imprisoned for injuring persons by his Aqua Cœlestis, while in Stow's chronicle it is recorded that a water caster was punished for exercising his quackery. He was set on horseback with his face to the horse's tail, which he held in his hand, with a collar of urinals about his neck, led by the hangman through the city, and was whipped, branded and then banished.

The old French jurisprudence felt some hesitation in pronouncing for or against medical liability, and Merlin believed that suits brought against physicians were rarely successful. He mentions a number of judgments which acquitted the physician. The parliament of Paris in 1696 gave the following judgment in one case, the court saying: "That surgeons are not liable for their remedies as long as they have showed no evidence of ignorance or rashness in their practice." And in summing up the case on which the court had rendered judgment, the Advocate-General Portail said: "There is only one case where suit can be brought against the medical profession, and that is when deceit had been practiced, in which case it is a true crime."

In 1596 the children of a surgeon, who had wounded a patient while bleeding him, were condemned to pay 150 pounds damages by the Parliament of Bordeaux, and in another case a surgeon was condemned, because he cut a child for stone in the bladder without the advice of a physician, to pay damages amounting to 60 pounds, with the injunction of the court never in the future to cut another patient for stone without the consent of some physician who was approved by, and who had been received by, the faculty of medicine.

Many other cases could be cited, but I think from what has been said in this short paper that medical liability has been sustained by all the courts of former times. The question of criminal malpractice I have entirely left aside, hoping at a future date to discuss the history of this important subject.

THE CASE OF LOUIS BITZER.[1]

BY EDWARD B. LANE, M.D., BOSTON,

Superintendent of the Boston Insane Hospital.

UPON first reading the account of the Bitzer homicides I believed his was probably a case of acute melancholia. It read like many cases where a victim of melancholia, with delusions, who, seeing nothing but disgrace and suffering for himself and loved ones, in his frantic desire to save them from awful misery takes their lives and then commits suicide. But after seeing Bitzer and talking with his family and friends, I found he was not nor had he been suffering from melancholia in the ordinary sense of the term. Melancholia is a disease of slow onset and runs a course of months. I have never seen nor read of a case of transitory melancholia. The line of reasoning in the writing is strikingly similar to that of a homicidal melancholiac. And here the similarity ends.

Transitory frenzy is described and after much debate upon the subject is, I think, now admitted as a rare form of mental disturbance. In transitory frenzy there is evidence of cerebral congestion, flushed face, congested eyes, furious excitement followed by a deep, profound sleep. During this excitement the victim runs amuck and may commit violent and unprovoked assaults upon any one he chances to meet. This case was clearly not one of transitory frenzy. There was no evidence of great physical excitement; the shooting of his family was deliberate and planned and intended suicide was confessed. There was no deep sleep. But in this case we still have to face the fact that a fond husband and a loving father attempted suddenly to annihilate his family, and the ordinary man is inclined to use his common sense and say, such a person must have been insane. Such a horrible, unnatural act is of itself evidence of an abnormal state.

To the medical man Bitzer did not appear insane at the time of his examination, in February, nor was there any evidence that he had previously suffered from any of the ordinary forms of insanity as observed in our hospitals for insane. The serious question arises, What was the explanation of this terrible deed? and was he responsible for it?

[1] Read at the annual meeting of the Massachusetts Medico-Legal Society, June 9, 1903.

Then follow the very practical questions, What shall be done with him? How shall the law be enforced and society protected? Unfortunately, laws cannot be so framed as to meet all individual cases and deal equitably with each one.

To find an answer to the medical question in this case, I made a careful study of Bitzer, personally, and inquired into his history. The case was much simplified. for all by the unusual document which he wrote immediately after the shooting of Ida. In this his state of mind is revealed and his intentions disclosed.

Upon examination by four physicians (Drs. Quinby, Houston, Scribner and myself), all familiar with the insane, we agreed that Bitzer impressed us as a man "not quite up to par, mentally." He was poorly nourished, weak and emotional. He was born in Germany, and no trace of mental or nervous disease was discovered in the family. He is said to have had a prolonged and exhaustive illness when a small child. His habits as to intoxicating drinks were very temperate, judged from the standard of his nationality. He drank a little ale or beer daily. Used spirits rarely. Did not drink while at work and was never drunk. He was liable to lose his self-control under slight provocation. It is related at one time that he was holding an auction when some one remarked that he must be about to fail in business or he would not hold an auction sale. He lost his self-control and smashed his hat and a piece of furniture near him. He admits this fact, but says he does not remember all the incident.

From childhood he walked in his sleep. His wife tells of repeated incidents of his sleep-walking. She would find him asleep on the floor in another room from that in which he had gone to bed. When anxious about his store, thinking of fire or burglars, he has been known to leave his bed and go to the store and in the morning have no recollection of it. One night his wife missed him from their bed and got up to look for him. She found him lying in a ludicrous position in the child's cradle with his head and legs hanging over either end. Only four nights before the tragedy she missed him and found him walking about another room, and had she not caught hold of him he would have walked out of the window.

His brother was a somnambulist as a boy. Two of his most intimate friends describe him two weeks before the tragedy as peculiar and "morose." He failed to greet them in his accustomed manner when they entered his store; he answered them in monosyllables and appeared nervous and his hands were trembling. At other times he was as usual. Bitzer failed to recall these incidents when I questioned him about them later.

Six years ago, when recovering from the grip, he became very excited

and tried to bang his head against the wall. It took two or three men to prevent him from injuring himself. They believed he was attempting suicide. He went to sleep after this temporary frenzy. He states that he knows nothing of this and that he never heard of it until questioned about it months after his arrest.

His account of the shooting was substantially this:

"Ida asked me to put away two revolvers. I closed one quick and it went off and Ida fell on the floor on her back. I did not examine her to see if she were dead. I did not touch her. I first thought of running away, as I was afraid of being arrested, and I took the money out of the drawer. I then thought of doing away with myself. I thought of going to the girl's home. Then I wanted to see my people before I died. I remember going to get a paper and kneeling at the table to write. The last thing I remember was putting on my hat and coat, which I did before I wrote. At the house I remember my wife's arm pulling at my neck and hearing her say something about shooting. I remember the officer at the lockup saying my boy was shot, when I got the same feeling I did when the girl was shot. I remember I came to the Greenfield jail in a sleigh. I came to myself here in the jail the next morning."

His wife says that when he entered the house he looked like a crazy man. His appearance was so unnatural, she asked him what was the matter. He made no reply, but went out into the kitchen.

Assuming that Bitzer's account of the shooting is true and that it is also true that he does not remember anything after the shooting of Ida, save the few incidents related, we must conclude that he was not in a normal state at the time of shooting the family. The coherent statement he wrote, his finding his way home and selecting his family in order are against the idea of his suffering from ordinary delirium. Nor is there any evidence that he was an epileptic. But he was subject to periods where there was a divided or dissociated consciousness. As is well known, this condition is not rare in epileptics and hysterics, and is identical with the hypnotic state. It is not uncommon for such a condition to succeed a mental shock. It usually lasts for hours, but may endure for months or even years.

In this condition it is not uncommon for there to be islands of memory; that is, there will be a memory more or less distinct of certain incidents, as in this case: Bitzer remembered feeling his wife's arm about his neck and hearing her voice as in a dream and of feeling the cold steel of the handcuffs as they were put on his wrists by the arresting officer. Very important is the circumstantial evidence in this case that Bitzer was a somnambulist. That is to say, it was well recognized that he was frequently subject to disturb-

ances of consciousness. The somnambulism was frequent from childhood. The periods at the store when he appeared preoccupied and failed to greet his friends in his usual manner and answered in monosyllables, and his denial of such occurrences, may possibly be explained in a similar way.

No one would think of holding one who had committed a crime during delirium or while dreaming, responsible. Yet, strictly speaking, is either the result of insanity? The defence of hypnotic influence has been set up in one or two cases. But there was grave doubt as to the criminal being in that state, but if we were satisfied that a crime was committed when the criminal was in a hypnotic condition it is certain the popular verdict would be for acquittal.

What then shall be said of the responsibility of Bitzer if he was in a state of divided consciousness and impelled by the horrible fears of a disgrace while in a condition of partial consciousness, as shown by his peculiar expression and no memory of the horrible and unusually exciting events? It has been found that in the half-waking or hypnagogic state people are particularly susceptible to depressing emotions. Depression tends to continue the hypnagogic state (which is practically identical with the hypnotic condition), and a case is told of a young man who was slow in waking and his sister, to arouse him, told him that his oldest sister had died suddenly and he must get up. Instead of awakening, he began to sob convulsively and finally alarmed his sister so that she called the oldest sister, who tried to reassure him by showing herself alive and well. It was of no avail and he had a series of convulsions and it was several days before he recovered his normal condition.

I believe that Louis Bitzer was profoundly shocked by the discovery that he had killed his clerk. As a result of that shock he at once passed into an abnormal mental state of partial consciousness, analogous to the post-epileptic, somnambulistic, hypnotic and hypnagogic states, where his judgment was largely suspended, his actions were automatic and the result of profoundly depressing emotions of fear and shame. Reflection and will power were largely in abeyance. He was an automaton and as is to be expected, he has no memory of the events. He is as irresponsible for them as if he had committed these crimes during sleep.

I do not believe it at all probable that he would again be guilty of a similar crime. It is probable that if he were hypnotized he would be able to recall the events that took place in his home. It is understood that I believe he was in a normal condition and responsible when he shot his clerk.

THE BITZER HOMICIDES.[1]

BY GEORGE P. TWITCHELL, M.D.,

Medical Examiner, Greenfield Mass.

LOUIS BITZER, thirty-six years of age, a jeweler by trade, in 1901 lived in Turners Falls. His place of business was on the main street of the village, and he lived on a side street a short distance from his store. His family consisted of his mother, his wife and three children, Anna, fifteen years of age, Caroline ten, and Louis Martin, five.

Ida Columbe, seventeen years of age, worked in the store for Bitzer as clerk or saleswoman. On the morning of Dec. 31, 1901, Ida went to the post-office to get the ten o'clock mail; when she got back they started to put away the Christmas goods in the back room. Bitzer had two revolvers, one of 32 and the other of 38 caliber, lying on a table in this room. Ida told him to put them away as she was afraid of them.

He opened one to see if it was all right and when he closed it it accidentally went off and shot the girl. When he saw that he had shot the girl he felt that he could not bear to be pointed out by people as one who had done a crime but had rather be dead himself, yet he did not want to die and leave his children, so he went home to take them with him and kill himself. Before leaving the store he wrote a statement of the accident on a large sheet of brown paper. What he subsequently did he does not remember, but he did go to his house and shot his wife, his two daughters, and his son; the boy, who was in bed recovering from an attack of measles, was killed and the others more or less seriously wounded; all recovered. He was disarmed by his wife, sister-in-law, and mother, and shortly afterward was arrested. He told his mother that he had shot Ida Columbe. At the station-house he gave to one of the officers the statement he had written at the store. It was as follows:

Starting in to work, Ida and myself putting goods away which were left over from Christmas, I put away my revolver which I have taken home with me nights to protect myself and Ida late at night. Looking it over and closing it up it went off accidentally and killed the poor little girl. For Heaven's sake don't blame me about it. The moment it went off I thought by myself what will become of

[1] Read at the annual meeting of the Massachusetts Medico-Legal Society, June 9, 1903.

my dear wife and children, so I do not want to be looked upon as a man thinking that he committed a crime, so I will die for it, and I cannot die without having my poor children with me. Take us all to church and sing our last farewell, "Nearer my God, to Thee." Farewell to those who have loved us. Have John Gould take care of our bodies. My business affairs, write to Mr. Wm. S. Dana and J. Aschin, 43 Maiden Lane, and the two gentlemen will look after my business affairs. Everything I leave behind will be for my dear old mother and Martin.

I, for my last words, sitting here and write this pitiful letter, wish you all good luck. This is a sorrowful thing but it must be done, and O My God don't blame me for it. I wish my dear old mother and brothers good-by.

Your beloved Louis Bitzer.

About 12 o'clock I first viewed the body of Ida Columbe. In the back room of Louis Bitzer's store I found her, lying on the floor on her back, the legs fully extended, the feet about three inches apart and resting on the heels, the forearms flexed and the hands resting on the chest. Her head was slightly turned towards the right and rested on a man's ulster, which was arranged as a pillow. She was fully dressed, without her outer garments; the clothing was all in good order, the skirts covering the tops of her shoes and fully extended under her body; her underclothing orderly arranged. Blood was about her mouth and nostrils, smearing the side of her face and neck and upper part of her blouse and a little on the ulster. A penetrating wound was in the head, in the hairy scalp, just in front of the left ear. Lying on the floor, on the left side of the body near the knee, was a hairpin with a velvet knot on it. One hair ribbon was on the head and another was found under the buttocks when the body was removed.

The body lay in the comparatively narrow space between the table and safe, with the feet about one foot from the front of the sink. This was an iron sink, open underneath, and from about six inches under the sink, extending nearly to the heels of the body, were two nearly parallel marks or scratches on the floor. There was a mirror hanging over the sink on the wall, and a comb lying in it. Her hat, outer garments and chatelaine bag were on the table.

The autopsy showed a well nourished young woman, 4 feet 11½ inches in height, weighing probably about 115 pounds. Blood was about the mouth, nostrils, left side of the face and in the hair on the left side of the head. One inch anterior to the highest point of the left ear was a penetrating wound, the edges of which were blackened and burned. The hair around the wound was singed and brain substance oozed from the wound.

On removing the brain the course of the bullet was found to be on a line parallel with the horizon; the bullet passed entirely through the brain and was reflected back and was found in the right lateral ven-

tricle. The organs of chest, abdomen and pelvis were normal. Her hymen was intact. Autopsy on Louis Martin showed that the bullet entered through an opening in the left parietal bone, bordering on the coronal suture and two inches from the union of the coronal and sagittal sutures, passed superficially through both hemispheres and broke out a triangular piece of bone from the parietal bone on the right side at its eminence. The bullet was found in the substance of the brain directly under this loose fragment of bone.

Both lobes of the left lung and the lower lobe of the right lung were congested. Pleuritic adhesions were in the left thorax. All the other organs were normal.

After an indictment for murder had been found by the grand jury against Bitzer, the district attorney requested Dr. Frank W. Draper to conduct experiments to determine at what distance the revolver must have been held to singe and burn the hair and scalp. I had the pleasure of being present at these experiments.

The same revolver and similar ammunition were used, namely, the one of 32 caliber. The targets were various places on the hairy scalp of cadavers. At a distance of 6 inches the hair was not singed; between 3 and 4 inches the results were similar to what I saw on the head of Ida Columbe. I understand experts, employed by the defense, found they could singe hair at a very much greater distance. They used wigs as targets and the question arises as to whether that might make a difference in the results.

Bitzer was examined by experts as to his mental condition. The case never came to trial. The plea of murder in the second degree was offered and accepted by the government.

WHAT WAS THE CAUSE OF DEATH?[1]

BY A. ELLIOTT PAINE, M.D., BROCKTON, MASS.,

Medical Examiner, Brockton.

On the morning of Jan. 3, 1903, I was notified of the death of Mrs. S., aged thirty-nine, whose death was supposed to have been caused by poison.

The autopsy showed a well-nourished female, who weighed about 130 pounds. All the organs of the body were normal except the stomach, which contained one quart of grayish fluid. The mucous membrane on its posterior surface was somewhat congested in an area of 2 by 3 inches.

The stomach, one pint of its contents and sections of the liver, kidney and brain were sent to Prof. E. S. Wood for further examination.

Investigation showed that Mrs. S. had been divorced for two years, and had been given the custody of her children, a girl aged thirteen and a boy aged nine, together with $10 per month as alimony.

In September, 1902, while living in Whitman, her daughter became ill. The mother reported at that time and later that her child was being poisoned by its father, and that the child was under the influence of some woman. The father visited the child and consulted a clairvoyant, from whom he obtained two bottles of medicine, part of which was given to the child.

A physician who attended her found no evidence of the administration of poison. She was, however, extremely nervous.

The mother said that she found a white powder scattered upon the bed, floor and window sill in the child's room.

She told the child and others of her powers as a medium, and that she could tell the future and know what was being done by others, etc.

In November she and her children moved to Brockton, taking the rooms in which she died. Soon after going to Brockton Mrs. S. mixed the child's medicine and took them to the chemist of the Board of Health for examination. He did not tell her, but after her death, he informed me that the medicine contained a large amount of arsenic.

Some three weeks before she died, Mrs. S. was found in bed with a

[1] Read at the annual meeting of the Massachusetts Medico-Legal Society, June 9, 1903.

man. They were immediately arrested. He pleaded guilty and paid his fine. She appealed her case.

On Dec. 29 she and the children drank cocoa with their breakfast. In the afternoon she went to Whitman, refusing the company of her landlady, who offered to accompany her. At 5 P. M. she returned, complained of being very sick and distressed and was helped to her room and put to bed. She was nauseated. A physician attended her until Jan. 1. She said that her husband had poisoned her, repeating this statement to a lawyer who had been called to make her will, also saying that she would live but a short time. The lawyer advised her to call Dr. B. Dr. B. found her very nervous, but did not believe that she had been poisoned and made a favorable prognosis. On his next visit, however, the following day, she was vomiting and had burning pains in the stomach and intestines, a dry skin, an excited pulse and was passing only a very small quantity of urine.

He then accused her of taking poison. This she denied and said that she did not want to die. After considerable resistance she allowed him to pass a stomach tube. The stomach was washed out and its contents examined.

Her urine was drawn; it was scanty and highly colored. She grew rapidly worse, and at midnight her ante-mortem statement was taken. She said, realizing that she was dying, that her husband had poisoned her, and that she had taken no poison by her own free will. She died at 3 A. M.

A legal investigation followed.

The contents of her stomach from the washing, with the stomach tube, and the cocoa and milk found in her room, were examined for poison with negative results.

Witnesses testified that, in September, 1902, at the time her daughter was ill, she had purchased an ounce of arsenic. The daughter said that she saw the powder in her room in Whitman on the bed, floor and window sill; that her mother put a teaspoonful of the powder in the medicine which had been examined by the Board of Health; that she knew her mother was poisoned with arsenic and told her so, and that she persuaded her mother in consequence to join the church, which she did, about ten days before her death. The child is old for her years.

Another witness testified that Mrs. S. had on two occasions attempted suicide by jumping into a cistern. On each occasion she regretted her act, hollered for help and was fished out. Early on one morning, while her husband was away, she, in her night clothes, ran toward the river, saying that she would drown herself. A friend took her home. She begged of him that he should not inform her husband.

Several testified that for two years she had been saying that she and her children were being poisoned by her husband.

It was proved that Mr. S. had not seen her for several months and there had been no opportunity for him to give her any poison.

She did go to Whitman on the trip mentioned, where she drew some money on a check.

On her way home she called on a lawyer and paid him a retainer to defend her case. He assured her that she would only be fined if found guilty.

Prof. E. S. Wood examined the specimens sent him for poisons, with negative results.

The return of death was "Cause unknown."

This woman purchased arsenic, put arsenic in the medicine, had a chemist examine it, told her friends that she and her children were being poisoned, was taken sick, sent for priest and lawyer, told them she was poisoned and was going to die, and did die.

She had burning pains in the stomach and intestines, vomited, had retention of urine, a dry skin, pulse quick and weak, face showing distress, etc. What could have done it?

The case has been of interest to all who were brought in contact with it and now I want to know, what was the cause of death?

A BRAIN HARDENED BY KAISERLING'S METHOD SHOWING THE TRACK OF A BULLET.[1]

BY WM. P. WHITNEY, M.D., BOSTON,

Curator Warren Anatomical Museum, Harvard Medical School.

I WISH to call attention to a brain preserved by Kaiserling's method, which I think should always be adopted in the case of any injury, as it is the only one by which the seat and extent of the lesion can be accurately determined. The delay incident to this method of preparation would be rarely any obstacle in the course of a legal inquiry. The following case of suicide is an illustrative one:

A man who had been drinking hard fired two shots from a 32-caliber revolver at himself at 10.35 A. M. He was brought to the hospital at 11.07 A. M., and in the right frontal region were two ragged wounds, each one inch in length, with powder-stained edges, one lying on either side of the temporal ridge. About one inch towards the median line from wound nearest median line, a bullet could be felt lying subcutaneously, which was easily removed and no bony injury felt. Through the other wound a round hole could be felt in the skull. There was considerable hemorrhage, pupils normal in size, equal and reacted. No bleeding from ears or nose. Heart, lungs and abdomen negative. Patella reflexes were equally exaggerated, superficial reflexes absent. He moved his arms and legs about freely, apparently with equal strength and required restraint. Pulse 140, irregular, temperature 97.8 in axilla. Half an hour after admission the patient had a clonic convulsion which lasted about one minute and affected both sides of the face and extremities equally.

At 12.30 P. M. noticed that he did not move right extremities while the left were moved about freely. Right knee jerks more active than the left.

At 1.30 P. M. the left pupil was larger than the right and there was slight exophthalmos of the left eye. Increasing coma.

At 2 P.M. deep coma, but on painful stimulation there was slight motion of both arms, and the right extremities were flaccid. Pupils and other reflexes as before noticed. Pulse 128.

At 3 P. M. trephine opening made by the surgeon in charge, on left side, 1.5 inches behind and 1.5 inches above external condyloid process. Posterior branch of middle meningeal artery exposed and seemed to be formed by two small branches which formed a main

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branch at about the middle of trephine opening. Dura bulged, with a bluish tinge, no pulsation, arteries tied and dura opened. A dark blood clot escaped, followed by fresh blood and disintegrated brain. No trace of bullet seen. Hemorrhage rather profuse, direction not determined. Pulsation of brain returned after relieving pressure, but he never regained consciousness. Respiration stertorous. Pulse continued to fail, and died at 6.45 A. M.

Brain. Was hardened in bulk in Kaiserling's fluid [2] for about two months. It was then cut in a series of sections each 1.5 cms. thick and the track of the bullet located as follows:

It entered at about 4 cms. from the front of the right anterior lobe passed directly across, traversing both lobes. In the left one was a cavity the size of the end of the thumb, filled with blood clot and disintegrated brain substance. This opened upon the surface at the point where the trephine wound had been made. From this cavity the track turned almost at right angles and proceeded directly backwards, passing through the white substance of the left hemisphere and along the upper part of the convolutions of the island of Reil, in the middle part of which it was found to be lodged.

The case is interesting in the different courses which the two bullets followed. Either there must have been a great difference in the charges of powder, or the skull must have been very much harder or denser at the point where one struck than the other. Moreover, the one that penetrated the skull must have struck the opposite side, rebounded, turned around and destroyed the brain substance extensively at that point. It then went in a direction at nearly a right angle to that in which it was originally fired, and finally lodged at about the middle of the hemisphere.

In concluding I wish to express my thanks to Dr. Bottomley for his kind permission to use the clinical notes of this case, and to Medical Examiner Harris for the opportunity of obtaining the specimen, which is preserved at the Warren Anatomical Museum at the Harvard Medical School.

[2] KAISERLING'S METHOD FOR THE PRESERVATION OF SPECIMENS WITH THEIR NATURAL COLORS.

Slices of organs from 3–5 cms. thick are placed from 3–5 days in

1. Formalin	200 cc.
Aq.	1,000 cc.
Nitrate of Potash	15 grm.
Acetate of Potash	30 grm.

They are then removed, the fluid allowed to drain off, and placed in
2. Alcohol 80% for 6 hours, then
Alcohol 95% for 2 hours.
From this directly into

3. Aq.	2,000
Acetate of Potash	200
Glycerin	400

for permanent preservation in a dark place.

Further details for the preservation of whole organs, etc. should be studied in the original article.

THE RESPONSIBILITY OF THE MEDICAL EXAMINER.[1]

BY HERBERT PARKER, ESQ.,

Attorney-General of the State of Massachusetts.

MR. PRESIDENT AND GENTLEMEN OF THE SOCIETY:

He who addresses medical examiners has need to speak carefully, even ingratiatingly; he must appeal to your kind consideration, for it is certain that to the medical examiner, of all men, we must look for the truth to be spoken of us, after we are dead; and there is grave significance in this.

You have probably, you younger medical examiners, examined the statute to see the material origin of your authority. You older men have long since forgotten to look for any such assurance as statutory authority because you draw it now, rightfully, from your experience. You would have been surprised to find that the statutes of the medical examiner are different than what you have found with relation to the appointment of any other executive judicial examiner of the Commonwealth.

You will learn, have learned, to your great satisfaction, that the requirements for your appointment as medical examiners are, first, that you shall be discreet men, and second, that you shall be profoundly learned in the science of medicine. It is to this field of your responsibility that I would call your attention now.

You are assumed to be, and you must be, discreet men before you are qualified to enter on the discharge of duties of the most profound importance to the community. You stand, gentlemen, upon that debatable ground over which there hangs always something of the atmosphere and shadow of doubt. The line between the medical and legal profession is the line between the medical and legal issue.

Only as you are enlightened by profound learning, only as you are guided by soundest discretion, can you pass upon the first and vital question of your requirements. I say that these questions are of profound importance to the community, for they concern not only the public interest that involves inquiry into the perpetration of the possible crime, but here again is the grave responsibility that rests upon

[1] Address at the Annual Meeting of the Massachusetts Medico-Legal Society, June 9, 1903.

every physician to whom of necessity is entrusted the tenderest care of the sentiments of numerous persons with whom you are concerned.

You are called by some hysterical neighbor or friend to come and view the body of some one suddenly stricken to death. The frightened relatives or neighbors know not from what source that bolt came, from where it fell. They know only that for the moment they stand awe-stricken in the presence of the awful mystery of death. You, gentlemen, are required to preserve, in that atmosphere of doubt and alarm and excitement, the full possession of your mental faculties. It may be that what we human beings call accident caused that death. It may be that there was some lesion of some organ when the death occurred. We can no more tell than we can tell what causes the lofty trees of the forest to fall, and you can hear the plaint and fierce ravages that shall come and tear the forests. It may be that death came from that source, and we know who alone is to be invoked for such source. It may be that death came from violence — and I use violence in its statutory sense; not that some blow was stricken and death followed, but that violence that means intervention of some power, — whether death came from a sudden incisive blow, or the instantaneous effects of a poison perhaps caused that death. In either case it is a violent death, and this violent death for your consideration and investigation should be any death not immediately explainable from the surroundings that come to your attention.

Now, then, you have been called upon to consider, maybe, the result of any one of these causes. It may have been caused by the voluntary taking of some poison instigated by the voluntary wish of the victim, so that he or she should be relieved all of a sudden of the anxiety of life.

You will not and you do not, and it is to the eternal credit of your profession and to your personal character that you do not, hastily draw conclusions. You should not hastily draw the conclusion that death was through the voluntary act of the woman or man who has died, for you are to consider the effect of a hastily spoken word of judgment by the physician, upon whose utterance the stricken family and friends and community wait, as they would wait the utterance of an oracle. You are not hastily to conclude that death was caused by suicide, even though it is the easiest avenue through which you can escape from your doubt, for that means, if it be erroneous in its conclusion, that you not only have too hastily passed upon a medical and pathological question, but too hastily you have assumed to judge of the conduct of a fellow human being. And your words are not lightly spoken, for they carry the weight of the learning of your great profession. They carry the weight of that confidence which has come to you through your living

and moving and being with and advising those who come to rely upon you.

You are not too hastily to conclude, and you do not, that the death was caused by the lawless act of some other, for the too hasty conclusion upon these lines is a twofold error. It would tend to fix suspicion first, upon some one who does not deserve such suspicion, and it sticks always, and years of righteous living cannot wholly obliterate the stain. It is a double error, because the too hasty conclusion of yours may lead to lines of investigation by the prosecuting officer or officers and they are shut off on other lines of inquiry through which and by which the truth might be ascertained. Far better not to pass upon it until the fullest and most exacting investigation can and shall have been made by you.

The statute requires of you in the performance of your duty what is not ordinarily required of any other officers, because their lines of duty are pretty clearly circumscribed and do not go from one field of inquiry or from one field of responsibility to another; the medical field is one, the judicial another, and so on through the complex departments of our government and administration of government. But you, gentlemen, are required to make, not merely such examination as will enable you to make a report precisely and exactly, as has been made by Dr. Twitchell here to-day, an example of medical precision, in the autopsy of the Bitzer homicide, — and I need not call attention to the other papers which enlighten and which give me great satisfaction as an officer of the Commonwealth; — in the consummation and the purpose of these inquiries by medical examiners you are required, not merely to inquire what the anatomical results are, but the statutes require of you that you shall make examination into the cause and conditions and circumstances concerning the finding of the body, that you are to call the attention of those persons who are supposed to have been in its presence, and who may be there, as to the position in which it lies, all of those things which to your mind may be significant, which explain the mystery which you are investigating.

Now, why are all these things required? They are, first, because of the general responsibility that rests with you by reason of the very subject, by your study and determination. They are further required of you because one of the primary functions of the medical examiner is the investigation of crime and the fixing of guilt where it belongs, and I need not tell you men, who are engaged with us prosecuting officers, that the end of the prosecution of every crime is not simply the fixing of guilt upon the guilty and securing punishment to those who can restore no life. It would be but a futile and discouraging effort that we are making. But this is not the ultimate end of prosecution

and investigation of crime. What we seek is, and that is what all law seeks, the protection and security of human life, and every conviction secured righteously, as all must be in our Commonwealth. Every offender who has taken human life, who is apprehended in his crime, should be punished, and must know the power of our law; and the effect on others, who may be likewise tempted, is to know that a certain hand of the law, guided by human agency, will mete out and apprehend, and that the power of punishment is in this law, upon which ultimate security can rest, until by the grace of God and the efforts of men there are changes in the criminal law that have never yet come.

Now, therefore, when you are called to inquire into the death of some one supposed to have died from violence, you are to steady yourselves, bring yourselves into that receptive, responsible state of mind that shall set your every faculty into keenest activity, that shall constantly invoke the senses and ample responsibility that is in you. Be mindful of those whose interests are put into your keeping, the feelings of those who may be cast down by your word; but more than all you are to remember that wherever this ultimate purpose of the criminal law shall be appertained, the protection of human life shall depend upon the closeness of your observation and material opinion and on the sentiments and inferences that you draw from those conditions, for you all know that the powers of the government first take their form and direction from the intimation that the medical examiner makes from the inferences that he draws from his examination.

Remember that the report on the autopsy that you make may be substantially the only material in which you may rely when the case may turn into a real case of homicide in court. The brain, preserved as this one we have here to-day, may not be brought before the court and jury by the physician who may be called upon one side or the other to advise the court or the jury. It might all turn on the fact of this demonstration. The vindication of the law may all turn on the accuracy which you may have made and reported in your autopsy. You may have overlooked some detail that only momentarily attracted your attention. It may be that, by passing that door, you have gone by the avenue through which you could have passed very absolutely the question demonstrative of the cause of death.

I am saying to you these things which have occurred to every one of you. I am teaching you nothing. I am speaking to you of these things of which we all are reminded, and for us, we shall never forget that we will not discharge our duty if we suffer ourselves for a moment to be diverted from the absolute concentration on that which lies before us. Inferences one way or the other may be drawn from a statement. not absolutely verified by the autopsy. Or, if you make in your report

of your autopsy suggestions that investigation might have made demonstrations rather than suggestions, the true inferences seen in the one case in the o her are eliminated. Omit nothing that the closest scrutiny could suggest. Remember that the day is coming, gentlemen, when you are not to be confronted only by those persons who know nothing where you are wholly wise. The laymen who stand about, waiting for what you may tell them, contribute little to what you may tell, but rely on your manifesto. A case occurs, when your every conclusion is going to be disputed, when the inferences of guilt that you have drawn are unfounded. You cannot meet this attack that will be made upon you by counsel and by physicians, whose duty it will be to draw inferences, if there be any reason, differing from those that you have drawn.

The only method is by the absolute certainty so far as anything human can be of your original investigation and your report. It cannot be met, believe me, gentlemen, by any ingenuity and reasoning, by any manifold duty and resentment of counsel. No ingenuity of convincing or manifold reasoning will permit you to meet this issue that you have got to meet.

Prepare yourselves by assuring yourselves that nothing in suggestion to your brain or mind has escaped this investigation. Then the case will be presented in court beyond a question of dispute of what the autopsy did reveal, leaving only legitimate elimination of the inferences that can be drawn from them.

This is the responsibility of the medical examiner briefly stated by one who is interested as you are in seeing to it that the beneficent purposes of our law, framed in our statutes, find its realization in the courts of justice, which are the places where human injuries manifest themselves, and the effort to make our human system of law follow along so far as we are able, to preserve them, and transform them to the divine law, under which we live and must ultimately go.

A CASE OF TRAUMATIC CEREBRAL HEMORRHAGE.[1]

BY C. A. ATWOOD, M.D., TAUNTON, MASS.

I PRESENT to your notice to-day a case of traumatic cerebral hemorrhage.

It seems to me that the case may be of interest, not only in its medico-legal relation, but surgically.

E. M., a French-Canadian, age forty-four, was returning from the city to his home on an electric car at about 9 P.M., June 7, 1902. While the car was in motion and fearing probably that it would not stop in front of his house, he attempted to save time and distance by getting off. The result was that he was thrown into the road, striking upon the back of his head. The road had recently been repaired by filling with sand and it was soft. He got up and went to his home. A short time after he complained of not feeling very well and sent for his physician. The physician at that time found no serious symptoms. E. M.'s condition, however, became worse and the physician was again summoned, who found him unconscious and pronounced the case one of apoplexy, for which he bled him.

E. M. never regained consciousness and died at 6.40 A.M., June 8, 1902. I viewed the body and performed an autopsy at 3 P.M. There were no visible marks of violence on the body. The symptoms followed by coma before death all pointed to some acute cerebral injury. On reflecting back the scalp, beneath it and near the occipital protuberance of the occipital bone was found a blood clot. The cranium was opened and there was no fracture of the skull. The dura was tense. When opened quite an amount of cerebral fluid escaped. The sinuses and vessels of the pia and brain were full and engorged. In the frontal lobe of the left hemisphere near the longitudinal sinus was a blood clot the size of a golf ball. This was the only lesion found and caused death by cerebral pressure. Macroscopically there were no other lesions.

The theory is that the man fell forcibly on to the back of the head with sufficient momental violence to cause by contre-coup a rupture of a blood vessel in the anterior portion of the brain opposite the site of the original injury.

The Court asked this question: "If there were no external marks of violence and no fracture of the skull how was it possible to state that the cause of death was due to violence or the fall?" The answer was: "The man never having had any cerebral symptoms of disease before,

[1] Read before the Medico-Legal Society, Oct. 7, 1903.

and in this case having come on immediately or soon after an injury, with the finding of an ante-mortem blood clot beneath the scalp, in the region where he was struck when he fell with force, was evidence enough to consider the hemorrhage of the brain, which caused death, to be due to injury and not to previous disease, together with the fact that there was no other pathological lesion present." *The Court so ruled.*

It may not be too much out of place to mention surgically something about this case. At the present time I believe that some of our more progressive surgeons advise even in the absence of localizing symptoms, if coma and other conditions are progressive, to interfere; that is, to open the skull in the sense of an exploratory trephining. The usual rule would probably be in a case like this, if undertaken, to trephine at the seat of injury. I have thought since if this had been attempted that it would certainly have been a long hunt for the seat of injury.

AN ATTEMPTED SUICIDE BY ILLUMINATING GAS.[1]

BY FRANK HOLYOKE, M.D., HOLYOKE, MASS.

THE toxic results of inhalation of illuminating gas are twofold, causing in some cases simple asphyxiation; in others "an intoxication by prolonged contact with the gas, leading to a toxemia and the formation of co-hemoglobin" (E. H. Bartley).

The following case is of the second type, in the acute form, and occurred on July the first, when the roomers in an apartment house were disturbed by moaning heard in a neighboring room which had continued through the afternoon and evening until eight o'clock. They knocked at the door but were unanswered. The police were called and on breaking in the door, which was locked and corked with rags and the windows closed tightly, quite effectually preventing the escape of the illuminating gas which was pouring into the room from two open jets of the chandelier, they discovered the air unbreathable and Mr. A. C., a man of forty-four years of age, lying back in an easy chair unconscious, in a high-studded room which was 12 by 15 feet square. He was removed from the room and the windows and doors thrown open. It may be well to note that this illuminating gas is a mixture which averages, through the year, two parts coal and one part water gas, according to the state inspector's test at Holyoke.

Dr. J. C. Hubbard of Holyoke answered the call within ten minutes and found his patient perspiring profusely, his clothes being drenched with sweat; the pupils were dilated, face cyanotic, the limbs relaxed, pulse imperceptible at the wrist, but a feeble heart's action was felt, beating about 140 per minute. Respiration was very slow and gasping and the jaw had dropped — in short what appeared to be a state of collapse.

Dr. Hubbard first tried artificial respiration, which was followed by increased frequency in respiration, while $\frac{1}{30}$ gr. of sulphate of strychnia in divided doses and $\frac{1}{100}$ gr. of nitro-glycerine, during the half-hour that he was in attendance, restored the pulse to the wrist, but the doctor had little hopes of his recovery. The patient being removed to the House of Providence Hospital, I was called as medical examiner at 9.30 P.M. I found him lying in bed stripped of clothing but covered with blankets. The body was pale and cold. The arms and legs had now become cold, rigid and in a state of tetanic convulsion. The pupils were markedly dilated and did not respond to light. The breath was strong with the naphtha-like odor of gas, which did not entirely disappear until the fourth day. Temperature by rectum was subnormal $96\frac{1}{5}$, which according to statistics appears exceptional. The pulse

[1] Read before the Massachusetts Medico-Legal Society, Oct. 7, 1903.

142, respiration 32 and shallow, with spasmodic action as though snapping for breath, and a thin frothy mucus had to be wiped occasionally from between the lips.

Physical examination showed feeble heart's action and large mucous râles over both lungs. These râles cleared completely on the second day. A strong draught of fresh air passing through the room from open windows, warmth to the body and heart stimulants hypodermically were the only measures taken for immediate relief.

The normal temperature was not reached until the third day, when it rose steadily to 100¾, the highest point reached, on the evening of the sixth day, and gradually diminished from the sixth, with slight feverish action throughout the second week. The pulse fell to 80 on the seventh day and respiration to 20. He voided urine in considerable quantity and involuntarily during the first three days. Bowels first moved by enema on the second day. Through the night of the second day he gradually regained consciousness, became quite rational and began to take liquid nourishment, though he swallowed with difficulty and cold water caused severe pain in the mouth and throat, producing a spasmodic action of the throat. He vomited his milk several times on the third day. For the first two days of consciousness he complained of great pain in his head, which was general, not localized, and also of a numbness of the limbs which continued for nearly a week.

On the morning of the second day my attention was called to a peculiar condition on the back of the shoulder blades and over the sacrum and buttocks; which parts came in direct contact with the easy chair where he was originally found sitting. These parts were thickened and brawny, bright red, hot and very sensitive as though scalded: but the brawny thickening was too deep for an external burn or for a recent bed sore. The skin was not blistered; but loosened in a few days, leaving a large denuded surface which healed over very slowly and was sensitive for several weeks. Numbness of the legs disappeared in about one week's time, and as this abated he suffered with sharp shooting pains in the left leg and foot, accompanied with motor paralysis of the muscles controlling foot and toes, from which he has not at expiration of twelve weeks fully recovered, though the muscles respond to the faradic current.

It was also interesting to observe the result of paralysis of the vasomotors of this leg, which, when allowed to hang from the bed, or, as in the second week, when he tried to stand up, rapidly filled with blood, the skin becoming turgid and deep purple with distended vessels until he felt faint. The right leg was unaffected, retaining its normal color. This vasomotor paralysis disappeared entirely by the sixth week and also the shooting pains in the limb.

The latest article that I have seen on "poisoning by illuminating gas" is a very clever one by Dr. Paul M. Pitcher published in the *Brooklyn Medical Journal* of May, 1903, in which he concludes that: "The toxic effects of inhaling illuminating gas are due primarily to chemical changes produced in the constituent elements of the blood,

this being a substitution of carbon monoxide hemoglobin for the oxyhemoglobin, so diminishing the supply of oxygen to the tissues. Further that the *direct cause* of most of the symptoms *is* the diminished percentage of oxygen contained in the arterial blood supplying the central nervous system" (compare Haldane, p. 443).

We may concede this effect of carbonic monoxide (the chief poisonous agent of illuminating gas) to *be* the primary cause of the paralysis of the sensory, the motor and vasomotor nerves, producing the variety of symptoms here observed, possibly also the exquisite sensitiveness of the mouth and throat to cold drinks. I am at a loss, however, to account for the peculiar *external* appearances over the buttocks and shoulders. The question naturally arises if it can be due to any local irritation from the poisoned sweat in prolonged and close contact with a surface preventing the free escape of the perspiration from those parts, or is it because the pressure, long continued, has caused a temporary emptying of the blood vessels which, being suddenly relieved from pressure at that part, react *more* strongly and fill to *excess* by reason of the *general* tendency to vasomotor paralysis, causing here such a congestion as to result in inflammation of the skin tissues? The latter supposition seems to me more plausible.

THE RELATION OF THE BURN TO THE BULLET HOLE AS EVIDENCE OF HOMICIDE vs. SUICIDE: REPORT OF THE NAGLE CASE.[1]

BY JAY PERKINS, M.D., PROVIDENCE, R. I.

On the morning of the 14th of November, 1901, the body of James Nagle was found lying on his bed at his home in East Providence, R. I., with a bullet wound in the right side of the head, 1¼ inches above and a little anterior to the junction of the ear with the head. Singeing of the hair extended 1½ inches above the bullet wound, a little back of the ear and a little below the angle of the mouth, the beard being about a week's growth. The body was lying in a natural position on the bed, the arms at the sides, with a 32-calibre revolver between the right hand and the thigh. The tenement occupied by James Nagle and his wife, Rose, both French Canadians, was in a basement and consisted of a kitchen and sleeping room. Back of the house was a wood shed. Mrs. Nagle claimed that James came home the preceding night a little after eleven o'clock, drunk (Mr. and Mrs. Nagle were both frequently drunk and quarrelsome), and drove her out of the house. She was afraid to re-enter the house and spent most of the night in the wood shed, going to a window of their bedroom at intervals and looking in at her husband. At about four o'clock in the morning, hearing no noise and thinking he was asleep, she entered the house, but he was by the stove and drove her out with the poker. After hearing the five o'clock whistle, she again started to enter the house, and looking through the window of the sleeping room saw "some fire or something" and heard "an awful noise." Thinking that he had probably killed their dog she rushed into their bedroom and saw "Jimmy" with his two feet on the floor and his body across the bed. She placed his feet on the bed, laid him straight and pulled the blanket over him. At that time he was alive, but breathing very hard and lived for half an hour. She then went to a neighbor's and asked that he go for a doctor for Jimmy, and upon being asked what had happened to Jimmy she replied, "He is shot, for I heard such a noise."

At a little after five in the morning the Police Sergeant asked Dr. Allison, the medical examiner, to accompany him to Mr. Nagle's house. When they arrived there they found the body in a natural position on the right-hand side of the bed with a bullet wound as described above. At that time Mrs. Nagle stated that her husband had shot himself, and that she had found him lying across the bed with his feet on the floor and holding a revolver in his hand, and that she had placed him in the position in which he was then lying.

[1] Read at the Massachusetts Medico-Legal Society meeting, Feb. 3, 1904.

On the pillow under his head was a blood spot three to five inches in diameter. No blood was found anywhere else on the bed. The fingers were relaxed, and though Mrs. Nagle tried to make them hold the revolver as she said she had found it they would not accommodate her. When asked where Jimmy got the revolver she said that she did not know, but later in the day she stated that he had traded a watch for it.

At this time the case was considered one of suicide, but later in the day it was learned that a woman said to be Mrs. Nagle had, a few days before, purchased at a hardware store in East Providence a revolver corresponding to the one found beside Mr. Nagle. After purchasing the revolver she asked the clerk to load it for her. This he refused to do, but he gave her five cartridges, not noticing whether she had selected a five or six chambered revolver. The revolver found beside Mr. Nagle had six chambers, one chamber being empty, one containing an empty shell and four containing cartridges. At the trial the identification of the woman purchasing the revolver as being Mrs. Nagle was not absolute, in that the one who purchased the revolver wore a thick veil so that the face could not be seen. Otherwise, the two corresponded, a special feature in the identification being the broken English with the French Canadian accent.

Mrs. Nagle was now charged with the murder and arrested and an autopsy was held. The bullet wound and burn were as above described. In the autopsy report no mention was made as to powder marks or the character of the wound, but at the trial the medical examiner stated that there were some powder marks. There was a large opening through the skull, and the brain substance and pieces of bone and powder were scattered along the track of the bullet in the brain. The bullet was found lodged "in the cerebellum, just above the medulla oblongata."

Mrs. Lawson, who lived on the floor above the Nagle tenement, testified that as a regular thing "Jimmy came home and made a noise at night and that in the morning Mrs. Nagle made a noise and jawed him." On the night of Mr. Nagle's death she was awakened a number of times and heard quarreling in the tenement below. Most of the time she could distinguish only Mrs. Nagle's voice, and at about three or half-past three in the morning Mrs. Nagle "hollered out" two or three times "I'll kill you." At about quarter past five she heard "a short noise about like a revolver."

I did not see Mr. Nagle's body, but was called into the case by the Attorney-General, who sent me a copy of the autopsy report with a request that I should advise him from a medical standpoint. The report of the wound was very meagre, being only as stated above. I had observed in my work that when burning of the hair or clothing is present the bullet wound is not in the center of the burn, and so, in studying this case, one of the first things I did was to experiment with the revolver found beside Mr. Nagle's body, using the cartridges from the box from which those in the revolver were supposed to have come. I found that there was a uniformity of results, that the

major part of the burn always corresponded with the hammer or "sight" side of the revolver. A perusal of medico-legal works at my command failed to show any reference to this with the exception of a small work by Reese. I then wrote to Dr. Draper in reference to these findings, and was pleased to receive an answer from him confirming my investigations and also giving me the reference to a paper read by Dr. Fish before this society and published in the BOSTON MEDICAL AND SURGICAL JOURNAL, Oct. 2, 1884, which treats the subject exhaustively, and shows that unless the revolver is held firmly as in a vise, there is no exception to the rule as I found it.

At the first trial of this case, I therefore testified that with a bullet wound in the right temple, 1¼ inches above and a little in front of the upper part of the ear, with the hair singed 1½ inches above the wound, some back of the ear, and the beard singed down to the angle of the mouth, the bullet following a direct line to the lower part of the cerebellum just above the medulla oblongata, with fragments of bone and powder scattered along the passage of the bullet through the brain, the revolver was held at a distance of between four and six inches from the head, the barrel pointing in the direction taken by the bullet, with the sight side of the revolver in the direction of the more extensive part of the burn, that is, in front of the right ear, and the trigger side towards the top of the head. The revolver in question being a cheap, Fourth of July variety, and of very hard action, it was improbable that such a wound should have been self-inflicted by anyone, and for myself would have been impossible, while, with the body lying in a natural position on the right side of a low bed, this was precisely such a wound as would be produced by a person standing beside the head of the bed and shooting with the right hand at close range.

At the first trial the defence put in no medical testimony in contradiction of mine. A new trial was, however, obtained on technicalities, and at the second trial your President also appeared as an expert witness for the state and ably upheld the state's claim that the position of the revolver was as stated above, and that the wound was improbably, almost impossibly, suicidal. The defence, at this trial, had two medical witnesses, Dr. William H. Palmer, who had served for eighteen years as medical examiner in Providence and for some years preceding that as coroner, and Dr. Jerome B. Green. Both of these witnesses claimed that there was no such rule as stated above in reference to the relation of the burn and bullet wound, Dr. Palmer characterizing our statements as "fanciful." He stated that his experience and experiments, of which he said he had performed a good many, showed that there was no constant relation between the sight

side of the revolver and the extension of the burn. He also stated that nothing could be told in reference to the position in which the revolver was held when the shot was fired, by the direction taken by the bullet through the brain, because of the possible deflection of the bullet. My testimony at the second trial was similar to that at the first, except that on further experimentation I changed the distance from the head at which the revolver was held to between three and six inches instead of four and six, because, with this revolver, it seemed as if I got more marked burning at four inches than at six. All of my work, however, makes me more firmly convinced than at first that in the relation of the burn to the bullet wound we have an accurate guide as to the position in which the revolver was held as regards the sight side of the revolver, this relation being more marked the farther the revolver is held from the object fired at until the point at which the burn fails to appear is reached.

At the second trial Rose Nagle was acquitted. It is the history of murder trials in Rhode Island that usually, when a second trial is obtained, the defendant is acquitted. In this case, the character of the man killed and the pitiful appearance of the defendant probably had as much to do with the acquittal as any lack of evidence on the part of the state.

Even the Attorney-General was moved by the defendant's appearance at the time he made his plea. She was partially blind, of small stature, and sat with her body somewhat doubled over and her feet on a box. In her hand she held a bunch of white pinks with a piece of newspaper wrapped about the stems, looking at them as if trying to derive some comfort from them. After the trial was over the Attorney-General remarked to the counsel for the defence that he was moved to pity by the forlorn appearance of the defendant, and especially by the way she held the white pinks. An amused smile came over the face of the defendant's counsel, and, on being questioned as to the cause of it, he said that on his way to the court house in the morning he saw those pinks and, thinking that they would look well in the hands of the defendant, he bought a bunch, wrapped a piece of newspaper about the stems, put them in the hand of the defendant and instructed her as to the manner of holding them, which instructions she faithfully carried out.

APPENDIX.

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THE MEDICOLEGAL ASPECTS OF AUTOABORTION.[1]

BY

CHARLES GREENE CUMSTON, M.D.,

of Boston, Mass.

Tardieu defines criminal abortion as: "The premature expulsion, violently produced, of the product of conception, independently of all circumstances regarding its age, viability, and regular formation." In order to produce abortion, women less frequently resort, at the present time, to the various socalled abortive pills and mixtures. They have recourse to a much surer method, which consists in acting directly upon the ovum, either by tearing the membranes with a more or less pointed instrument or detaching them by an injection of some liquid forced into the uterine cavity. Now it may happen that a woman who desires to bring about an abortion does not seek aid from anybody else, and performs it herself; and that this is not unusual nor of modern date is evident if one will read Dr. Hugh L. Hodge's lecture on criminal abortion, published in Philadelphia in 1854.

Generally speaking, in these criminal cases, there are several individuals accused, namely, the woman who aborts and the accomplices in the abortion. In the present paper, however, autoabortion will be alone considered, and although hardly mentioned in the classic textbooks on medical jurisprudence, it is, nevertheless, certain that this type of criminal abortion is far more frequent than is generally supposed. Can a woman commit autoabortion by acting directly on the ovum? This is the question that is to be solved, and it is quite worth while to study it carefully, because criminal abortion is justly punished with great severity by the law. It is consequently not at all surprising that the lawyer for the defense, in the interest of his client or clients, puts the above question to the medical witness, and if the latter admits the fact on principle, it is readily seen that he at once gives the defense a very powerful weapon and renders the prosecution very much more difficult.

In the first place, is it an easy matter for an instrument to penetrate the cervix without the use of a speculum? Vibert is of the opinion that the operation presents a certain number of difficulties; he tried it on 12 cadavers, using 1 hand, and failed each time, but he was always successful when both hands were used. He points out that the cervix recedes from the instrument, but that if it should be introduced, it will slip out with ease while the injection is being given, if it is not held in place with great care. This same authority was ordered to examine 3 women who said an abortion had been performed on them by another, who also admitted her crime, and he had the maneuver repeated in his presence. He was able to ascertain that the abortionist simply made a vaginal injection, and for this reason he concluded that the abortion in each case had been produced by other causes.

Now if individuals who are competent have such difficulty in intro-

[1] Read by invitation at the Massachusetts Medicolegal Society, October 7, 1903.

ducing the canula of an irrigator within the cervical canal, it would naturally seem that these difficulties would be much greater for a woman desirous of performing an autoabortion. But from what I can gather, it would seem that women of the United States, at least, resort more frequently to the use of some rigid instrument, like a knitting-needle, a catheter, or a penholder, and less frequently employ the injection method. Personal knowledge of numerous cases met chiefly in consultation practice have led me to believe that autoabortion is being done among a large number of women both in the cities and country, a large percentage of these being married. In order that a woman may perform the operation successfully upon herself, certain conditions must be present, and it is necessary to demonstrate whether all these conditions are required to perform autoabortion, or if, on the contrary, the operation can be accomplished by nearly every woman.

From what I have been able to ascertain, it would appear that most women introduce the instrument within the uterus while in a crouching position and I am aware of only a few instances in which they succeeded when in the recumbent attitude. Without wishing to anticipate what is to follow, it may be said that no matter what position the uterus may have, the autoabortion will succeed in a large majority of cases.

It is difficult to say what may be called the normal position of the uterus and the opinions of the highest authorities on anatomy vary greatly, being almost in diametric opposition with one another. It is, however, quite logical to assume that the position of normal uteri varies from one subject to another. In several cases of autoabortion the uterus was found in a position intermediary to anteversion and retroversion, while in others it was in anteversion. In one case, the woman admitted that she first attempted autoabortion but being unsuccessful she resorted to an abortionist. But in this particular case a number of adhesions were found which immobilized the cervix against the rectum, making the cervical orifice difficult of access.

In other instances of autoabortion, the uterus was found retroverted and under these circumstances, when the retroversion is slight, this condition will greatly facilitate the entrance of the instrument into the cervix because the external os being directly in the axis of the vagina meets, so to speak, the instrument as it enters the vagina. Theoretically, a marked retroversion should create an obstacle to the instrument not easily overcome, because when the cervix is situated behind the symphysis and directed upward, the fingers introduced within the vagina come directly upon the posterior aspect of the uterus in Douglas' pouch, thus rendering the external os extremely difficult to reach. In order to get to it, the finger must be pushed perpendicularly behind the symphysis. In such cases of exaggerated retroversion, it is common to find the uterus bound down posteriorly by more or less dense adhesions which keep the uterus immobilized in this position, but nevertheless, it is more than likely that after several attempts a woman with a uterus in this position might be able to insert the instrument within the cervical canal.

To sum up, it may be said that the position of the uterus plays only a secondary part in the problem, but it cannot be denied that its position is not indifferent as to the ease and success of the operation. When the organ is markedly deviated and especially when it is bound down by adhesions in an abnormal position, autoabortion may become extremely difficult to accomplish, to such a point that it may be questioned whether in reality a woman could successfully carry out the operation with these anatomic difficulties present. This is certainly a delicate medicolegal point, the cognizance of which may be of great importance to the medical expert for either the prosecution or the defense. Uterine displacements

are only important from the direction and position in which they place the cervix.

Admitting that a woman has a very movable uterus, easy to replace, it is necessary for the accomplishment of her crime that she can insert the instrument within the cervical canal when the distance or the condition of the cervix permits of it. The physiologic distance measured from the external os to the vulva varies from between 6 cm. to 8 cm. There are very short vaginas, measuring only about 5 cm., and there also large ones whose depth may attain 8 cm. or 10 cm., but it may be said that in a normal condition, a distance of more than 9 cm. is extremely rare. The average length may be placed at from 6 cm. to 8 cm.

Usually, a woman can easily reach her cervix, especially so when in the crouching position, because the uterus is pushed downward toward the vulva from 1 cm. to 1.5 cm. on account of the intraabdominal pressure, in which case the finger of the woman can easily reach it and place it in the proper position for the introduction of the instrument. In pregnancy the increase in size and the change of shape of the uterus must evidently influence its position. If one takes into consideration the classic descriptions given, it will be found that the fundus uteri projects slightly upward during the first 2 months of gestation. It remains in the pelvic excavation and undergoes a slight descent, which, according to some authorities is due to the increase in its size and weight, as well as to the pressure of the intestines which is brought to bear on the fundus. Other authorities uphold that such changes are far from constant and that one should take into consideration individual differences, which explains why in a large number of women the fundus uteri appears above the upper border of the symphysis during the first few weeks of gestation. The cervix does not undergo any descent or deviation and the organ does not point into the concavity of the sacrum. Charpentier has observed a number of cases in which the fundus uteri extended above the symphysis during the first 3 weeks of gestation and he has also found an exaggerated anteversion in primiparas which was sufficient to produce functional disturbances of the bladder from pressure.

Many authorities, especially the Germans, are far from admitting that retroversion with a descent of the uterus occurs during the first months of pregnancy. Schultze says that after the eighth week the enlarged corpus uteri may be felt in the anterior fornix, and personally, I have found this true in a certain number of cases. Necropsies performed on subjects dying during the first few months of gestation, in which the position of the uterus has been noted, are rare. One is recorded by His of a woman of 25, who hanged herself in the third month of her pregnancy. The uterus was anteverted and flexed. In another case, published by Braune, the subject was a young female 8 weeks pregnant. The uterus was in retroversion, the fundus lying against the rectum, and presented a slight retroflexion. In this case the tissues were perfectly normal, and it is difficult to say why retroflexion and version had occurred.

In most cases, adhesions usually maintain the pregnant uterus in retroversion, but the normal position of the pregnant organ during the first 3 months is, as can be seen, very variable, according to the authorities.

Now it is during the first 3 months of pregnancy that abortions are usually undertaken. After the fourth month the uterus, having become too large to remain in the true pelvis, extends upward, drawing the cervix along with it, which causes the latter to become more distant from the vulva. The examining finger some times reaches it with difficulty, even when the perineum is depressed, and at this distance it would seem impossible that a woman operating on herself could reach the cervix.

This is so, generally speaking, but in some cases the criminal may accomplish her end, and it is then that the talent of the expert must be called into play in order correctly to appreciate the conditions presented in the given case.

Regarding the condition of the cervix, we must consider both its external and internal os. The external os may be more or less hidden by the anterior lip, which may be found intact or lacerated, gaping or retracted, all of which points should be studied in detail. In 2 cases of autoabortion I have found a marked projection of the anterior lip, which proves that this is no obstacle to the accomplishment of the crime. If the cervix is intact without any old or recent laceration, it will dilate with ease, but if it is lacerated, 2 conditions must be considered. There is either gaping, which results from an ectropion of the entire mucous membrane, or on the other hand, there may be an atresia. In the first case, the result of an attempt to introduce an instrument is always successful, but in the second, it is doubtful whether the woman could accomplish her object. The difficulty would depend on the degree of atresia.

Beside the gaping produced by old cicatrices, this condition may also be found physiologically, and during the first few weeks of pregnancy it is not at all a difficult matter to introduce the tip of the exploring finger within the cervix. The conclusion that can be drawn is that during gestation, the condition of the cervix would facilitate the entrance of an instrument within the uterine cavity, and consequently render autoabortion an easy matter in most cases.

We will now suppose that the woman has been able to insert the instrument within the external os; it then remains for her to push it through the internal os. In accomplishing this 2 difficulties may present themselves, namely, a flexion of the corpus on the cervix, and, secondly, an abnormal decrease in its caliber. Flexion of the corpus on the cervix is almost always present in newly born females, but disappears as they grow; it is, however, met as a pathologic condition. When present, a slight bend of the canal at the internal os will exist, and this condition may prevent the instrument from continuing onward and puncturing the membranes. When badly directed, and if the instrument is a rigid one, it may enter the wall of the uterus instead of its cavity, and it is not at all improbable that certain accidents of this kind met in practice are due to this anatomic condition.

A flexion of the uterus may even present difficulties for a professional abortionist, and if lesions or traces of violence are discovered at the internal os it would be quite premature to conclude from these signs that another person had operated, should the pretext be given that a woman who had attempted autoabortion had failed on account of pain produced when pressure with the instrument was brought to bear upon the internal os.

The same considerations are applicable when the internal os is abnormally narrow. Generally, however, its caliber is quite sufficient to allow a fairly good-sized catheter to pass through. It is quite true that it is inextensible and that its direction is contrary to that given to the instrument along the vaginal axis, but it should not be forgotten that the uterus being oftentimes movable, the woman can replace it with ease and retain it in a convenient position while inserting the instrument. In this position both the external and internal os will be found in the same line in the axis of the uterus, or nearly so, and consequently all that is required is that the instrument should be pushed directly onward in order that it may enter the uterine cavity. Autoabortion will be as easily accomplished under these conditions as if performed by another person, on the condi-

tion that the uterus is freely movable. If the organ is held in a marked anteversion or retroversion by adhesions which cannot be stretched, the operation may be accomplished by a professional abortionist, but cannot be done by a woman herself.

Beside those difficulties of a purely material nature, which are few in number, there is another order, purely subjective in character, which would seem to have a great value. I refer to the mistake of situation of the instrument which certain women make, believing that they have the instrument within the uterus, when in reality they are only holding it against the external aspect of the cervix. They do not differentiate between the sensation produced by the instrument within the uterus and that caused when it presses on the outside of the organ. When, during an examination of the genital organs, a uterine sound is passed, the patient immediately notes a certain painful sensation, far different from that produced by the application of an instrument on the external aspect of the cervix. The instance mentioned by Vibert of the 3 women who admitted erroneously that they had been the victims of an abortion produced by an intrauterine injection, which in reality had been only an ordinary vaginal irrigation, is a startling proof. These women had certainly never distinguished between the sensations produced in the vagina and cervix from the one caused by the penetration of an instrument within the uterine cavity. The latter is never forgotten when once it has been felt, and in every instance in which a woman has not distinctly felt a pricking sensation in the lower abdomen when puncture has been resorted to, or the sensation of a hot fluid extending upward within the body when an intrauterine injection has been employed, the greatest reserve should be maintained by the expert, and if possible the experimental proof should be resorted to. When an injection is used for the purpose of bringing on an abortion, women when performing the operation upon themselves usually employ one of the hard rubber ends which go with any fountain syringe, and when once the tip is inserted beyond the internal os all that is necessary is that she should hold the tube in place and allow the liquid to enter the uterine cavity.

From a study of a number of cases in which the women admitted having performed an autoabortion, many of them being married in easy circumstances, and others belonging to the more ignorant class, it would seem to me that a woman need not be very familiar with the anatomy of her genital organs in order to accomplish quite easily the induction of a miscarriage. When a woman wants to rid herself of a fetus, it makes very little difference what social condition she may occupy, because in all ranks of life the woman will have the same criminal design, and when she is not fully aware how to proceed in the act, some friend, usually of the female sex, will be found who can give a detailed account of the modus operandi. To quote cases would be useless, but I can affirm that I know professionally a number of married women who perform autoabortion once a year at least, and in 1 or 2 instances they resort to the operation several times in the course of 12 months.

From what I have said, I think it can safely be admitted that it is often possible for a woman to introduce a foreign body through the cervical canal into the uterine cavity, and the logical consequence is that she is able to perform an autoabortion. For this reason I can not agree with some of the statements made in our best and most modern textbooks on legal medicine, a few quotations from which I will make. In Witthaus and Becker's Manual of Jurisprudence, Vol. ii, 1894, Cameron says: "Women often attempt to pass such instruments into the uterus themselves, and occasionally they succeed, but are very apt to injure themselves seriously." This is also the opinion of Herold, who makes a

similar statement in his Manual of Legal Medicine, published in 1898. In the fourth edition of Wharton and Stillé's Medical Jurisprudence, it is stated that: "In some instances the woman seeks to rid herself of her burden . . . by the introduction of instruments into the womb. These attempts are often unsuccessful when made by the female herself, and even an ignorant accomplice." I am perfectly willing to grant that women do injure themselves by attempting autoabortion, and I know of several instances in which it has been attempted and had to be given up on account of the impossibility of introducing the instrument within the cervical canal, but in each case the medical witness must make a special study, because certain details will often be of greater use to him than the knowledge obtained from the textbooks which indicate only the means by which the crime is accomplished.

When a case of autoabortion has been alleged, the medical expert in his examination need pay very little attention as to the distance existing between the cervix and vulva, and although displacements of the uterus have their importance, they can be of no absolute indication one way or another. Perhaps the most important condition is that of the presence of adhesions, because when they are present, binding the uterus either anteriorly or posteriorly, it is probable that the woman could not introduce an instrument within the external os. Old, thick, and fibrous adhesions act like ligaments and solidly retain the uterus in its abnormal position, and when this abnormal position is well marked, the expert will probably not be wrong in affirming that a second person has been required to accomplish the abortion.

Atresia of the cervix, when it exists, should be taken into account, but its value against the possibility of autoabortion, is only a relative one.

It is also of importance to ascertain the intellectual condition of the accused, because it is probable that an intelligent woman will take in the situation better and be able to accomplish her end with more address than a woman endowed with less brains, although there must be many exceptions to this rule. Beside, an intelligent woman will be more daring and will be less liable to tell her secret than will the unintelligent one. In all questions of criminal abortion, the smallest details will be useful, and it is often by little facts that the discovery of the truth is attained; and in conclusion, I would once more repeat, that in the question of autoabortion I cannot subscribe to the opinion usually advanced in the wellknown works on medical jurisprudence. Without taking into consideration the arguments that the defense might be able to extract from what has been said, I simply am desirous of throwing light on the question which, up to the present time, has been badly studied. The medical expert should always have present in his mind that his first duty is to discover by all the means possible the proofs or evidence of some description of an accomplice; but he should also bear in mind that in the case of a criminal abortion an accomplice is not always necessary, and that often a woman of only moderate intelligence and ability will attempt to rid herself of a pregnancy when the latter is injurious either to her interests or to her reputation.

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DEATH AND SUDDEN DEATH.[1]

BY L. M. PALMER, M.D., MEDICAL EXAMINER, SOUTH FRAMINGHAM, MASS.

THE number of interesting and puzzling cases of sudden death, that, as medical examiner, I have been called to pass upon in the last three years, has brought the subject I have chosen to-day a great deal to my mind, and I have thought that it might be of interest to you, and this is my excuse, if any be needed, to occupy your time with such a doleful subject.

Some may justly say, Tell us how to save the living. It needs no argument to prove that could we autopsy all our cases that die, we should get many surprises and be much better doctors. One of the most profitable features of my study in Vienna was the chance to see the causes of death. Every case that dies in this great hospital at Vienna is autopsied, not by students, but by expert professors. I was often allowed to examine a case one day, see it operated upon the next day and then see it posted the next or a few days after. The advantages of this you can easily understand.

The chronic sick like the poor we shall always have with us, and we often have more time than we want or need to study their cases, but the case that dies in a few hours or moments of time taxes our resources to their limit, and we cannot know too much about them. While thinking out this paper, my mind has floundered about over the whole range of physiology, toxicology, criminology, psychology, theology, and some other ologies that I will not mention. The result is, that I have usually come back to my starting point of gross ignorance. Death has usually been defined as absence of life or cessation of physical life. This only puts the question back one point farther, and leads us to ask, What is life, and when does it begin and when does it end?

The usual teaching is that life begins with conception. In another sense the spermatozoa are alive before the time of conception. As to the complex processes of human life, between birth and death, our daily work as physicians has ever to do.

It is to the time, circumstances and causes of death and sudden death that I wish to call your attention at this time. I wish here and now to acknowledge my indebtedness for material for this paper to a very instructive book written by Dr. Brouardel, director of the Morgue at

[1] Read before the Massachusetts Medico-Legal Society, June 12, 1906.

Paris. It would seem at first thought as though there need be no question as to whether or no a person is dead. Ordinarily there is not, but on the other hand, at times it is of great moment to know, first, whether a person is really dead or only apparently dead, and second, as to when the person actually dies. For instance, a man and his wife are drowned together, or are in some calamity or accident where the disposition of great wealth hinges upon the delicate question as to which one died first.

The popular idea is that a person dies when he ceases to breathe. We watch at the bedside for the last breath or gasp, and when that comes, we say solemnly they are gone. Are they gone? Perhaps and perhaps not. Some twelve years ago, more or less, I delivered a sickly and exhausted woman of twin boys, when by the ordinary rules of procedure she died. Sure it was, she drew her last breath and her heart stopped beating. Was I nervous, do I hear you ask? I was nearly dead myself with fright. I am inclined to think I stopped breathing, but I am sure my heart did not stop pounding. I need not tell you there was something doing about that time, and after what seems an age, my patient lived again. A drowned person draws his last breath, and yet he can be resuscitated after several hours' time.

Another class of persons regard the heart's action as the criterion. Since Galen's time, it has usually been conceded that a person or animal is dead when the heart stops beating.

Brouardel quotes a case, authentic, reported by Dr. Reynaud and Paul Laye, where a man was decapitated in their presence, and they rode in the van which carried his body from the scaffold, and yet this man's heart was beating one hour after his execution. When did this man die?

Most of the processes of living are through reflex actions. As long as they are stimulated all goes well, but when they are paralyzed all goes wrong. Let me give an illustration. Tickle the smallest possible space of a sensitive person's nose with the tiniest of feathers and what happens? He loses all interest in the outside world, telegraphic dispatches are sent to all reflex centers, all processes stop, his muscles become set and rigid, and finally the diaphragm makes a mighty convulsive effort, and the man sneezes a snort that will make the shingles rattle, and the agony is over.

On the other hand, suppose under some stimulation of emotion or violence, these reflexes instead of being stimulated are paralyzed; then we have what Brown-Séquard has called inhibition, with a long train of evils. For instance, if the pneumogastric nerve is excited the heart stops, and if the excitation is strong enough it may stop permanently and the person dies. Some of the functions of the body are independent

of each other. The hibernating animals, for instance, can reduce the functions of respiration and circulation to a minimum. There are many illustrations of this power in the lower forms of animal life.

It is also to be seen in certain nervous conditions, such as hysteria and catalepsy, when, to the casual observer, the person may seem to be dead, and perhaps called so. This leads to the question of apparent death and the possibility of being buried alive, a possibility that makes us all shudder.

Repeated attempts are made by our state legislatures to enact further safeguards against this horrible possibility. Has it ever been done? I have no doubt it has been in a few instances that can be vouched for by medical men.

To avoid this, different nations have established different laws concerning burial. In France the law requires them to wait at least twenty-four hours between death and burial. In Germany it is forty-eight hours, while in England it is customary to wait till post-mortem changes take place, thus remaining true to the traditions of Greece and Rome where they waited from six to eleven days. Australia usually buries on the day following death, while Spain and Portugal require only five or six hours, which led a witty man to remark that it wasn't safe to sleep too long in those countries, for fear of being put under the ground. So far as I know there are no laws in this country, as regards time necessary to keep a body.

In certain parts of Germany they have mortuary chambers, where everything possible is done to verify death, even to the placing of a bell-cord in the hands of the corpse. Though they have been used for one hundred years, the bell has never been rung but once, and that was when rigor-mortis passed off, and the hand fell down, dragging the bell cord. I will not take your time to go over the signs of death, though there are certain features of them that are intensely interesting to me and I think would be to you, but I will now call your attention to some of the principal causes of sudden deaths.

HEART DISEASE.

One of the commonest scapegoats, upon which to lay sudden deaths that we do not know the cause of, is called heart disease. The strangest part of the thing is that this diagnosis seems to satisfy everybody, excepting possibly the doctor who makes it. That disease of the circulatory system is responsible for very many sudden deaths is, however, undoubtedly true.

First. — The causes arising in the heart itself are, first, fatty overgrowth on the heart, where there is a deposit of unnatural amount of fat upon the surface of the heart, which penetrates into and destroys the

muscular functions of the heart. It begins early in life and gradually increases with age, and gives practically no symptoms for its detection.

Second. — Fatty degeneration of the muscle itself. Here the deposit is not upon the surface but invades the very structure, and weakens it. It shows itself in autopsy by a mottled appearance in the heart muscle and its development is slow and stealthy.

Third. — Fibroid degeneration is of the muscle itself due either to an acute or chronic myocarditis. The acute form usually accompanies infectious diseases like small-pox, diphtheria, typhoid fever and pneumonia and acute rheumatism. The chronic form is usually due to obliterating diseases of the coronary arteries, such as arteriosclerosis.

Fourth. — Syphilitic diseases of the heart are often to be seen in large cities and metropolitan hospitals, where the *morale* of the people is not as good as in the country.

Fifth. — Rupture of the heart sometimes occurs, though rarely. Sudden death does not immediately follow, and strange as it may seem they sometimes recover. A case was reported by Moullin in 1896 of a twenty-year-old football player who received a blow over the heart, but continued to play for twenty minutes. Three weeks later after great suffering his pericardium was incised and six pints of clotted blood were removed and the patient eventually recovered.

Personally, I have never seen a rupture of the heart. Effusion into the pericardium is another cause of sudden death. This acts mechanically by interfering with the heart's action. Paracentesis has been performed for forty years or more, and often successfully, but the frequency of a fatal syncope in these cases should make every operator guard himself by having medical assistance, and warning the family. Two cases have been recently reported where a sewing needle had worked its way through the pericardium and caused death. In aortic insufficiency, a sudden death is due either to an anemia of the brain, an anemia of the heart, because the coronary arteries cannot nourish the heart, or, third, a degeneration of the heart muscle itself.

The sudden deaths usually follow some unusual exertion or mental shock. Many sudden deaths occur from mitral and tricuspid incompetence, especially on great exertion, as running for a train. With this disease is also associated frequently bronchitis and acute edema of the lungs. Frequently also will appear an albuminuria, and the person die with uremic coma, and the physician or others lay the blame upon a hypodermic injection of morphia, when the person dies from the coma, and not the morphia.

Dr. Forbes, an Englishman, says that out of 64 persons having angina pectoris whom he had seen, 49 of them died suddenly.

Another author who draws a finer line as to diagnosis says that all cases of true angina die sooner or later suddenly.

The most frequent cause of sudden death is due to arteriosclerosis, as shown by the fragile blood vessels, or the resultant aneurisms. The two organs most affected by this condition are the brain and the kidneys.

The aneurisms are chiefly of the great arterial trunks, such as the aorta. Rarely veins may rupture, and especially varicose veins, and the person die from hemorrhage.

I saw one such case a few years ago, where a woman, sixty years old, when alone, had a varicose vein of her leg burst and before she could get any help, she became too much exhausted from loss of blood to survive the shock.

Thrombosis and embolism contribute a very large number to sudden deaths. Any condition that will set up an inflammation in a vein may cause an obstruction, and any separation of a part of this thrombus may cause, through an embolism, impairment of function in some distant part to the extent of causing death. This is a common occurrence in lying-in women. Women having phlebitis are often allowed to get up too soon. One author says that out of 150 cases of sudden deaths, due to displacement of blood-clots, 112 cases of death were within two to three weeks after the thrombosis began.

Death from embolism, from separation of a blood-clot around a fracture of leg is quite common, and may occur very unexpectedly, when doctor and patient think he is nearly well.

I have seen two such cases, one of which I autopsied, and found a big clot in the pulmonary vein, shutting off a large portion of one lung; an interesting fact here is that it was no more than a pneumonia might put out of commission, but the suddenness of the onset seems to give a shock sufficient to kill. This cause also frequently occurs in cancer and phthisis. This seems to be especially true of cancer of the prostate. The idea in some of our older books on surgeries that sudden death was sometimes due also to air entering the veins, during an operation, particularly in the neck, is now practically forgotten, or regarded as untrue.

I shall now call your attention to cases of sudden deaths due to lesions of the cerebrospinal system.

It is a matter of surprise to one who has not made a study of it, to learn how tolerant the brain is to foreign bodies — abscesses and tumors of different kinds. For instance, several cases have been reported where autopsies have been made and pus found in the meninges of the brain and spinal cord, which gave practically no symptoms, but death came suddenly.

Abscesses of the brain also give sometimes but little indication of their severity or extent. I have autopsied two cases of abscess of the

brain, one of whom died after only a few hours of sickness. The second case had been sick for many weeks, but the process was evidently going on for many months previous, and while he was working. Both cases were due to broken down gummata.

It is always well to remember the easy communicability of infectious material and disease from the middle ear to the meninges. Persons rarely die suddenly from epileptic convulsions, though it sometimes happens. There are two interesting symptoms pointing to this cause of death. First, there are spots on the neck and shoulders looking like flea bites, the conjunctivæ are injected, — the tongue usually bitten, and the bronchial tubes filled with mucus. Second, there remain from time of death a stiffness of the fingers, wrists or elbows or some other place that was convulsed.

There is another large class of cases where sudden death is caused by what is called by Brown-Séquard inhibition. This may be set up by a slight cause and many illustrations could be cited to illustrate it; for instance, death has been caused by the sting of a bee, the extraction of a tooth, the opening of a felon, the lancing of an abscess of the neck, the breaking of a bone, a blow over the larynx, over the nape of the neck, epigastrium, tapping of a hydatid cyst, the passing of a sound and so on through nearly the whole list of things, that the busy doctor is doing nearly every day of his life, and in none of such cases would a post-mortem show anything abnormal.

Trousseau says, in his clinical lectures, that women have been killed by tickling the soles of their feet. The examples of the fatal effects of grief, shock from good or bad news, excessive joy, are all too well-known and familiar to need mention. The effect of the two extremes of grief and joy seems to be the same. This principle is one of the chief stock in trade of the sensational story writers and dramatists, who usually use it for the purposes of a climax.

Sudden deaths from obstruction to the larynx are relatively common, and are easily recognized and explained. In my limited experience I have seen two cases, where drunken men were choked by a piece of meat being drawn into the larynx while eating, perhaps by a hiccough. Contrary to the usual conception of the disease it is possible to have a latent acute or chronic pneumonia, which is not revealed by symptoms during life and discovered only by autopsy after a sudden death.

We have probably all of us had our bitter experience in being hurriedly called to a person literally drowned in his own blood, as sometimes occurs in phthisis from severe hemorrhage from the lungs. I know of no more harrowing experience. It has been my misfortune to have seen four of such cases.

The most common cause of sudden deaths due to the respiratory

system is pleurisy with effusion. This has been explained in various ways, but none of them satisfactory. The danger oftenest occurs at the time or following paracentesis. This fact has led many physicians and surgeons to refrain from drawing off all the fluid in the pleural cavity. Some of these cases are due to pulmonary embolism, and others to pulmonary edema, due to a rapid engorgement of the lung from a sudden relief of pressure. Sudden deaths due to lesions of the stomach, duodenum and intestines are usually due to perforating ulcers. The simple round ulcer of the stomach is a frequent cause of death. It may give but little if any evidence of its presence, till it perforates and sets up an intense peritonitis which makes short work of its victim.

The same is true of a perforating ulcer of the duodenum.

I autopsied a case, a short time ago, in a neighboring town, of a man fifty years old, who had only slight symptoms referable to his stomach, which were regarded as those of indigestion. He worked regularly, and went to work on the morning he was taken sick, but soon returned home, because of severe pain, apparently in stomach and bowels, which persisted till he died about twenty hours later. The symptoms were not considered serious till near the end, and were not clear as to origin. I found a perforating ulcer near the lower portion of the duodenum, with contents into the peritoneal cavity, setting up a peritonitis, with no fever. The perforations of the intestines are frequent, and are due to cancer, tuberculosis, dysentery and typhoid fever. I have operated upon one case of perforation in typhoid fever with a fatal result. I saw another case, where the symptoms of perforation were confused by a miscarriage taking place at the same time.

I autopsied another case, where one of our nurses who had had an appendectomy done a few weeks before, and had apparently done well, suddenly developed severe pain in bowels with distention and vomiting, but no fever. A diagnosis was not agreed upon by those who saw her. The autopsy showed several perforating ulcers of the small intestine near the cecum, the nature of which was not clear.

Deaths from accidents and diseases referable to the liver, spleen and pancreas are not very common.

A ruptured liver from violence is a not uncommon accident and usually ends in sudden death. I have had one such case. A ruptured gall bladder, from ulceration from gallstones, is another common method of passing on.

Cirrhosis of the liver sometimes gives a hemorrhage from the stomach that may prove suddenly fatal. Hydatid cysts of the liver may also burst, and cause sudden death by setting up an acute peritonitis.

As regards the spleen, it may be said, that in those countries where malaria is common, it becomes very hard and fragile, and is often rup-

tured. I cannot find that that is true in this country. Sir J. Y. Simpson records three fatal cases of rupture of the spleen during pregnancy, parturition and the puerperal state respectively.

Dr. Whitney, of Boston, has also recorded a case where a pregnant woman ate a hearty supper, apparently well, and had severe pain in the night following, resulting in convulsion and death. It was supposed the convulsions were eclampsic, till an autopsy showed a rupture of the spleen, with a discharge of four or five pints of dark fluid blood into the peritoneal cavity.

Sudden deaths occur sometimes from diseases of the pancreas, especially from what has been lately recognized as a condition of fatty necrosis. We have lately had an interesting case of this condition in our Framingham Hospital, where life was apparently saved by a prompt, severe and radical operation. The case now seems perfectly well.

I have not time to touch even upon deaths due to rare diseases with us, as the plague, or the common ones of diabetes, gout, acute rheumatism, anthrax and diphtheria. I presume we have all unfortunately seen our patients die suddenly and unexpectedly in diphtheria. These cases are, without doubt, due to a myocarditis.

You will be interested, if not comforted, by the fact that repeated cases are on record, where women have died suddenly from a simple vaginal examination in a doctor's office, whether because of it or not I can't say, but this seems to be especially true of those having fibroma of the uterus; of course it is to be expected and is easily understood why there should be sudden death in cases of extra-uterine pregnancy.

I have no doubt that many of these cases are unrecognized, though the symptoms are marked enough to make a mistaken diagnosis unnecessary. Gallard says hematoceles are ruptured fetal cysts, while Virchow says they are from another source.

When we come to sudden deaths from the kidneys, we are on fertile ground. Allow me to digress sufficiently to say that my knowledge of my own practice and that of other practitioners leads me to believe that we are wofully ignorant of the important part our kidneys play or work in the processes of health and disease.

They are the great emunctories of toxins and waste products of digestion and elimination. Death naturally supervenes when the poisons manufactured in the system and by indigestible food are thrown off because of diseased kidneys, and we have therefore auto-intoxication. Too often our fears are allayed by finding no albumin in the urine and the false conclusion reached that therefore the kidneys are all right, forgetting that we can have uremia without albumin, and albumin present in what otherwise appear to be perfectly healthy subjects.

When the kidneys become irritated or congested they fail to eliminate. The intimate relation between kidney and heart disease need only to be mentioned to be remembered. Still another and a more common source of sudden death is alcoholism.

This operates in three ways. First is the case where a person dies the first time he gets the so-called dead drunk.

The principal cause of death in these cases is the cooling down of the body; some cases in hospitals have shown a temperature as low as 75.2° F. This is the result of the paralysis of the vasomotor system, allowing an excess of radiation of heat.

Brouardel tells of an interesting method in France in olden times, effective and scientific if not elegant, of treating these cases. They put the drunken man on a manure heap, and then covered him up. The manure being warm prevented his cooling down to the danger point. Another method that has been demonstrated by which the body is cooled, is that the blood of a drunken man lacks in oxygen and so combustion, regular respiration and production of heat are interfered with.

The second cause of sudden deaths in alcoholism is from delirium tremens, where the person dies from exhaustion.

Chronic alcoholism is the most frequent cause of sudden death. In my work as medical examiner, alcoholism, directly or indirectly, has caused more sudden deaths than any other two or three things combined It allows many acute conditions to run a latent course, and will cause acute lesions in organs of the body, which may result in death.

Dr. French, superintendent of the Medfield asylum, once told me that twenty-five years' experience had taught him that alcohol was the most certain and constant poison that he knew of.

I want to emphasize another point, and that is our responsibility as physicians to see that an alcoholic, who becomes abnormally suspicious and begins to have hallucinations of sight and hearing, ought to be cared for.

If he is not a fit subject for a sudden death himself he is liable to cause some other more valuable person to be.

I think it is unfortunate that a crime is so frequently excused on the plea that a criminal is not responsible because drunk.

He certainly is responsible for the preliminary steps leading to that condition, and so should be held responsible for his crime.

Sudden deaths among children are very frequent. In London, in 1854, West states that out of 627 cases dealt with by the police, 272 of them were of children under the age of five, and 126 of these were under the age of one year.

The principal causes of sudden deaths in children are syncope, convulsions, asphyxia, pulmonary congestion and intestinal troubles.

Fatal syncope is not common, but I presume we have all had our sad experience with convulsions. It is never safe to assure a family there is no danger in convulsions, for they are always dangerous. The vitality of the child is low, and requires but little inhibitory influence to kill it. The so-called "inward convulsions" of the laity and old-time nurse refer to a spasm of the glottis which sometimes even kills in the adult.

That pulmonary congestion should prove quickly fatal in children is easily understood when we remember the size of the little bronchi and bronchioles and how easy it is for them to fill and shut off all air.

From what I have thought and written out, I have come to the following conclusions:

First. — That we cannot say absolutely when the exact time of death occurs.

Second. — That there is such a thing as apparent death.

Third. — That there is a possibility, remote though it may be, of a person being buried alive, that has not been embalmed, or seen by a medical inspector.

Fourth. — That it is the duty of every doctor to inspect every case reported as dead and satisfy himself of the fact by careful examination.

Fifth. — That it would be in the interest of science and humanity, that no body should ever be buried without a medical examination.

Sixth. — That every case of sudden death, as well as those of violence, should be reported to the medical examiners in this state.

Seventh. — That we should use our influence as physicians to educate the public to a greater willingness to allow more autopsies.

CRIMINAL ABORTION. PERFORATION OF THE UTERUS WITH PASSAGE OF THE FETUS INTO THE ABDOMINAL CAVITY, AND PROLAPSE OF THE INTESTINE. DEATH. DISMEMBERMENT.[1]

BY FRANCIS A. HARRIS, M.D., MEDICAL EXAMINER, AND WILLIAM F. WHITNEY, M.D.

LATE in the afternoon of Sept. 21, 1905, a suit case was discovered floating in the water off the house of the Winthrop Yacht Club, Boston Harbor. It was found to contain the torso of a woman, wrapped in white oilcloth. At the autopsy made the following morning, Sept. 22, three problems confronted the examiner: first to establish the identity of the individual; second the time of death; and lastly its cause.

For the first the clews were very meager. The texture of the skin and general contour of the body pointed to a woman between eighteen and twenty-five years of age. A later careful examination of the ossification by Prof. Thomas Dwight showed her to be very close to twenty years (her exact age was twenty-one). The little axillary hair that remained was of a light brown (the pubes had been shaved) and this together with the fair color of the skin classed her as a blond rather than a brunette. Her height was estimated at about five feet four or five inches. Professor Dwight's computation fixed it at five feet four and one-half inches, which was practically accurate. This was all that there was to aid the authorities in their search.

As to the time of death, any aid to fixing it from the rigor mortis was wanting from the absence of the limbs and head. All that remained to judge from was the appearance of the cut muscles where they had been severed. From their freshness it was estimated that it was only about twenty-four hours since they had been cut, and as decomposition elsewhere was but little advanced, that the death had not long preceded this.

In reality the time was considerably longer, being fifty-eight hours after dismemberment, which was done from twelve to fourteen hours post-mortem. The suit case was in the water about forty-two hours before its discovery. The protection afforded by the valise and the wrapper had prevented the action of the water, and together with the drainage away of the blood accounted for the good state of preservation and fresh look.

The cause of death was very evident, and the story of what preceded it seemed fairly clear.

The external examination showed that the limbs had been disarticulated with but little hacking, and the neck cleanly cut through between the sixth and seventh vertebræ. It was evident that whoever had done this must have had an anatomical training, or considerable practice. Another incision, evidently post-mortem, extended from the ensiform cartilage to the pubes; and still

[1] Read before the Massachusetts Medico-Legal Society, June 12, 1906.

another shorter one at right angles to it about midway in the upper half of the abdominal wall. A little to the right of the former was a surgical wound reaching from midway below the umbilicus to the pubes. The upper part was closed by sutures and the lower part was continuous with the post-mortem cut. The wound did not show any evidence of union, and a probe passed without the slightest difficulty between the edges, nor was there any reaction visible about the stitches.

The breasts were enlarged, the areolæ were conspicuous from their dark color, and colostrum could be squeezed from the nipples.

The internal examination showed that the stomach and intestines, with the exception of the rectum for a short distance above the anus, had been removed. The heart and lungs, liver, spleen and kidneys were intact and normal.

The uterus was enlarged to about the size of the third or fourth month of pregnancy, was empty and contracted. In the anterior wall just above the cervix was a transverse rent passing completely through it about one and one-half inches in length. Its edges were sloughing, but were united partly by sutures, some of which were loose in the necrotic material. On the inner surface of the fundus was a slightly elevated superficially gangrenous area like a placental site. Subsequent microscopic examination showed blood sinuses, recently thrombosed, and a tissue with decidual cells. What remained of the peritoneum presented the evidences of a recent peritonitis. In the pelvis, about the uterus, were packed a couple of gauze sponges soaked with pus.

From the above it was inferred that a criminal abortion had been procured, and at that time or later the uterus had been perforated, and a peritonitis had set in. Subsequently, a laparotomy had been performed, but death had followed very shortly afterward, the body had been dismembered and thrown into the water to conceal the crime.

This was not quite in accordance with the actual facts, and the reason for the discrepancy will be discussed later.

On Oct. 27, the limbs were found floating in another suit case in a different part of the harbor from where the first one was, and from the rings left upon the fingers the identity of the person was speedily established.

This was followed by the arrest of two men, who confessed that they had thrown the different parts of the body overboard. They located the place where the head was dropped, and it was recovered on Nov. 5. They pleaded guilty and were sentenced to seven years in the state prison.

Their story also implicated two physicians, one of whom was arrested and stood trial, but was acquitted. The other was accepted as a witness by the government.

The history of the case as brought out during the trial showed that the deceased was exposed during the third week in April, 1905. On Sept. 9, she had an abortion procured and was afterward sent to a private hospital. As the fetus did not come away she was curetted four days later, on the afternoon of Sept. 13. This, however, failed to achieve the desired result. The operator left, intending to return and complete the operation on the following morning. But either at that time by the curette, or later during the night from the sharp bones of the more or less mutilated fetus, the wall of the uterus was perforated

and the fetus expelled through the rent into the abdominal cavity. The next morning a coil of intestine, stripped from its mesentery, was found projecting from the vagina.

A laparotomy was performed, the fetus removed, the necrotic piece of intestine resected and an end-to-end suture made. The tear in the uterus was sewed up and the abdominal wound partly closed, the lower part being left open for drainage of the peritoneal cavity.

The patient seemed to do well for three days, but suddenly collapsed and died early on the morning of the fourth day, Sept. 19. That same afternoon the limbs and head were cut off; the intestines removed and burned up. The arms and legs were packed together in one large suit case, the trunk of the body in another, and the head in a leather travelling bag with about fourteen pounds of shot. During the evening these were cast into the harbor from a ferry boat.

Aside from the sensational and popular interest which such a case arouses, there are several points which should be dwelt upon as interesting in their medico-legal aspects.

In the first place, the careful envelopment of the trunk and its submersion in cold water kept the cut ends of the muscles in such a fresh condition that a mistake was made in fixing the time of dismemberment too shortly before the discovery.

In the second place, in estimating the time of death after the laparotomy there were apparently several conflicting factors which gave rise to error in this regard.

The surgical wound in the abdominal wall had not the slightest evidence of union, nor was there any sloughing of the edges or reaction about the stitches. This seemed to point to its having been made just before death. On the other hand there was a very slight growth of hair over the shaved pubes, but it was suggested the shaving might have been done at the time of the abortion and not of the laparotomy. Then, too, why a surgeon should suture a gangrenous uterus without at least cutting away the slough was incomprehensible. But the apparently fresh abdominal wound seemed to outweigh these objections. It is possible that the action of the water may have dissolved any union and soaked out the blood so as to make the wound appear fresher than it was. A surgeon of large experience has also stated, in discussing this case, that he has seen just such a condition of a wound even after four days. At any rate, in fixing dates such a possibility must be borne in mind.

The mistake in regard to her general type was due to the fact that there was only a little axillary hair to judge from, and her head hair was assumed to be as light or lighter than this rather than darker.

The estimate formed of her height and age was practically correct.

In regard to the condition of the uterus, it can be stated in a general

way that puncture of it is by no means a rare occurrence. But the peculiar combination of it with the passage of the fetus into the abdominal cavity, and a prolapse of the intestine into the vagina is very uncommon at this stage of pregnancy, and only two other cases have as yet been found.

The first is reported by Brouardel,[2] and is briefly as follows:

On Nov. 23, 1896, a young woman, about four months pregnant, was curetted under chloroform by a physician to procure an abortion. During the operation the uterus was perforated and a loop of intestine dragged down into the vagina. At the same time the head of the fetus, which had been separated from the rest of the body, passed into the abdominal cavity. The intestine was replaced either at once or a little later. It does not appear that it was torn from its mesentery, and had not been down long enough to have become gangrenous.

At the end of eighteen hours a laparotomy was done, the head of the fetus removed and the uterus sutured. She lived for three days and died from peritonitis.

The autopsy showed the rent in the uterus to have been in the superior, posterior part, and was closed by four sutures.

The second is an unpublished case of Drs. H. E. Marion and J. C. Munro, who have kindly allowed the use of their notes, of which the following is an abstract:

A married woman about two months pregnant had an abortion procured on April 21, 1897. After it she went to her home in Brighton, three or four miles distant, having been told to return the next day for treatment, if she was all right. She became very ill during the night, and the next morning (April 22) her husband went to the address she gave to him, and requested that a physician be sent to care for her. In response to this two women came out and used instruments, causing her such pain that her cries could be heard all over the house. One remained about an hour, then returned to town saying she would send a physician at once. The other woman stayed until two o'clock. A man came about four o'clock in the afternoon but made no other examination than to take her pulse and temperature. He said she was all right and told her husband to send for the family physician. He was called but refused to take charge of the case under the circumstances.

The next day (April 23) the husband again went to the house where he had been the day before, but the woman whom he saw pretended to know nothing about the case or that any one from that house had visited the patient on the previous day. Finally she said she would send a physician, who arrived about three o'clock. He made an examination and requested a consultation, and as a result Dr. Marion was summoned. On reaching the house about four o'clock he found the doctor sitting in the dining-room, who told him that an abortion had been done in this case. That on examination he found something in the vagina, which on cutting away he thought was a piece of intestine. The specimen was produced and proved to be about three feet of the small intestine. At this time the pulse was 120, and the temperature 99.5°. Dr. Marion at once

[2] Brouardel: L'Avortement. Paris, 1901, p. 344.

recognized the gravity of the case and arrangements were made to have her taken to the City Hospital where she arrived about 7 P.M. At the examination made then it was recorded that she did not look very ill, the abdomen was soft and slightly tender in the lower portion. The bladder contained concentrated urine. Hanging from the vagina was a piece of black gangrenous gut about six to eight inches long. Laparotomy was advised and at once performed by Dr. Munro. There was a brownish fluid in the abdominal cavity. In the top of the uterus was a ragged rent one inch long in which the gut was constricted, and close to the uterus it was black and gangrenous. The healthy gut was clamped off on each side of the uterus, and the cut ends united. The prolapsed intestine was then pulled upward into the abdomen and cut from its mesentery close to the free edge. It measured sixteen and one-half inches. The rent in the uterus was closed. The upper two thirds of the abdominal wound were sutured, the pelvis was packed and drained. The interior of the uterus was curetted. On the next day (April 24), the patient had recovered fairly well from the operation and was apparently steadily gaining up to 3 P.M., when without warning she suddenly grew worse, became delirious and died.

The autopsy by Dr. Draper showed the cause of death to be peritonitis.

The similarity of the accident in our case with the first of these is very striking, as in both the perforation followed curetting, and the fetus, or part of it, passed into the peritoneal cavity while the intestine passed out.

In the second case it is not known when the uterus was perforated, but probably by the women on the second day. Nor is it known what became of the embryo. All that is stated is that the uterus was found empty at the time of the laparotomy, nor was anything from it found in the abdomen.

In conclusion it must be borne in mind that a spontaneous rupture of a healthy uterus is unheard of under the fourth month. Therefore when such a condition is found it can positively be stated as due to some instrumental or other violence, generally in connection with a criminal abortion.

A CASE OF DEATH FROM THE ELECTRIC CURRENT WHILE HANDLING THE TELEPHONE AND AN ELECTRIC LIGHT FIXTURE.[1]

BY A. ELLIOT PAINE, M.D., MEDICAL EXAMINER, BROCKTON, MASS.

On the night of Nov. 30, 1904, about half past six, I was summoned to go to the Oil Works and it was stated that Harry Masters was dead. He was superintendent of the Standard Oil Works at Brockton and Kingston.

I went to the office, and found every one had been too frightened to call me up, and did not dare to touch the telephone. The bookkeeper was in the office, and he said he did not dare to touch anything. I found Mr. Masters' body lying in the inner office on his back. The telephone was by his side; the cord to the receiver was broken and the receiver lay on the floor. To his right was an incandescent desk lamp, broken, which was suspended from the ceiling by a cord.

The bookkeeper said Mr. Masters had come in about ten minutes past six, had called up his house, told them he would not be home for a little while, and had just said good-bye and hung up the receiver when he heard a crash and saw a flash of light. He went into the room and found him lying on the floor as I found him. He was not positive whether it was the telephone or the electric lamp cord that was in Mr. Masters' hand, but in trying to disengage it he received a shock himself, throwing him against the wall. The team was sent after the inspector to have him investigate the case, and he immediately came. An officer was placed in charge, and in the morning we went up there and looked things over.

When I examined the body, I found the inside of the thumb burned, a deep burn extending to the bone on the forefinger near the knuckle, and a deep burn in the palm of the hand nearly to the bone. The telephone cord was burned off. The cord is not insulated; there is simply a light webbing over small wire. The wire was burned.

In examining the telephone, the handle which holds the receiver (nickel plated) was burned on the inside or underneath part. The supposition was that as he went to put the receiver on, his hand came in contact with this metal, and as he took hold of his lamp on the desk to move it, he received the charge from the electric light. Instantly the plugs at the central office were blown out. The expert explains at the inquest that the wire from the telephone was not powerful enough to stand the amount of electricity on it, and blew out the plugs. The inquest shows that there were 3,500 volts on the principal wire, and

[1] Read before the Massachusetts Medico-Legal Society, June 12, 1906.

1,500 would be sufficient to kill. The telephone wire simply carries electricity from batteries, amounting to about 4 volts.

In talking with the bookkeeper, he said that they had had trouble with the electric wire before; that one man who worked in the engine room, in turning on the light one night, received a severe shock, throwing him down. The electric light company were notified about the condition of the wire. They made a superficial examination and found no trouble. The only examination they made was by going along on the ground and looking up at the wires. He also said that in turning on his electric light he would get a severe shock, and if he put his hand near it a blue flame would come.

Of course the electric light men and the telephone men tried to throw the blame on each other. The electric light men had gone out that night and located the trouble, although they did not say anything to us.

Next day the transformer was taken down and sent to my place and locked up; but the inspector of wires informed me it was not in the transformer that the trouble lay; it was on the wires where they had crossed each other. He had had them cut out. The swaying together from the wind had burned off the insulation, and that night the whole 3,500 volts passed through the telephone wire.

THE GROVER SHOE FACTORY DISASTER WITH REFERENCE TO IDENTIFICATION OF BURNED BODIES.[1]

BY A. ELLIOT PAINE, M.D., MEDICAL EXAMINER, BROCKTON, MASS.

I HAVE been requested to report my experience in the Grover Shoe Factory fire. I do not know as it will be in any way important, but it shows what duties may be thrown on a medical examiner at any time.

On the morning of March 20, 1905, within one hour after starting the factory, the boiler exploded and set the factory (a four-story wooden building, employing about 200 men and women) on fire. Within a half hour I was on the spot and then nearly the whole factory was consumed. Fifty-eight lives were lost; two died after being taken to the hospital, the others were taken from the ruins — not one having a feature for recognition, the only means of identification being parts of the clothing which were on the bodies, and a few by the teeth. One, an old friend of mine, was identified by a small piece of a handkerchief, and two keys which dropped from the body on removal. There was no doubt, as the keys unlocked his wardrobe door. About one o'clock we began recovering the bodies; and they were taken to a temporary morgue, where I examined them, and a description was taken and noted and each body numbered. What appeared remarkable to me was that while many of the men were nearly armless and legless, the sexual organs were visible, and the hair about the scrotum and abdomen still showed plainly. I also took charge of all valuables in the ruins, and all of any value have been identified by the friends. I allowed none to visit the morgue, unless they showed they were after some friend, and then they only saw the pieces of clothing and that particular body. No woman was allowed to see any of the bodies.

The city has provided a burial lot where each body lies separately with a marker and number, as I had them, so the superintendent can tell who are males and females.

[1] Read before the Massachusetts Medico-Legal Society, June 12, 1906.

AN OBSCURE CASE.[1]

BY S. F. QUIMBY, M.D., MEDICAL EXAMINER, GLOUCESTER, MASS.

THE case I report is not a sensational one, perhaps not deserving of being called obscure.

C. W. H., of West Gloucester, married, twenty-one years old, previously in good health, a shoe cutter by occupation, employed in a Lynn factory, complained one night last May of not feeling well.

He went to his work the next morning but returned to his boarding house at 10 A.M. complaining of a bad headache.

His symptoms grew worse and at noon he decided to start for his home in Gloucester.

He did not go home but went to one of those havens of refuge called Emergency Hospitals, one of which had recently been established in Gloucester.

His history as given by the hospital authorities was that he entered at two o'clock in the afternoon complaining of intense headache and pain in his legs; said he had had a chill.

Temperature 102°; diagnosed as grippe. He was put to bed and given a compound acetanilid tablet containing 2½ gr. acetanilid. These were repeated every two hours.

His temperature rose during the evening to 103°, fell to 100° and shortly before death to 96°.

He made very little complaint during the night, wanted the room dark and to be let alone. His legs, or the lower joints, were hyperesthetic, any motion or handling painful. At 2 A.M. the nurse in attendance noticed a change for the worse, also a peculiar petechial eruption. The proprietor and assistant were hastily summoned, heart stimulants were given hypodermically without avail and at 3.30 he died.

Meantime two or three of the local doctors who would consult with the hospital physicians had been called in. They were unable to decide on diagnosis or cause of death. Poisoning, black measles, or small-pox was suggested. At 5 A.M., I was summoned and viewed the body.

I found a young, well-developed adult male.

No external marks of violence. The most striking feature on inspection was the dark petechial rash most marked on the face but extending over the entire body and limbs.

The whole skin was of a light bronze hue, with dark blue spots which around the mouth were almost livid. I never before saw a rash that exactly resembled this one. He lay flat on his back with legs extended, feet, especially the right

[1] Read before the Massachusetts Medico-Legal Society, June 12, 1906.

one, strongly inverted. Arms flexed across the trunk. All the limbs and muscles were rigid. I did not notice any especial retraction of the neck. The eyes were injected and pupils dilated. There had been incontinence of urine and feces.

I regarded the case as probably one of cerebrospinal meningitis, but the air of mystery and talk of poisoning led the authorities to ask for an autopsy, which was made at three o'clock that afternoon.

At this time the rash and coloring had faded a little but still remained very pronounced. On incision fluid blood oozed freely from the vessels of the skin and subcutaneous fasciæ. The lungs were normal, the heart the same, both ventricles empty.

The liver was deeply congested, the kidneys normal but hyperemic. The stomach contained perhaps a pint of dark grumous fluid; there was no evidence of inflammation. The mesentery was slightly inflamed, its vessels full of fluid blood. The bladder was empty; the meninges and brain were hyperemic; fluid about base of brain and cerebellum increased in amount and slightly turbid, suggesting a beginning pachymeningitis.

A specimen of the cerebral fluid was taken for further examination by a young doctor present at the autopsy, who later reported that he could not find any of the specific meningococci in the sample he investigated. No examination of the spinal cord made.

I was virtually satisfied that it was a case of cerebrospinal meningitis with a suspicion that he might have used too many headache remedies. But the hospital physicians did not share my views, perhaps afraid that it would give the hospital a bad name.

The young man, who was married three months before, carried a small insurance policy. The hospital physicians filled a certificate for the beneficiary; afterwards I gave another. The correspondence that followed with the insurance company led me to think that to some medical men at least the case was a very obscure one.

A CASE OF DEATH FROM AIR EMBOLISM OF THE UTERINE SINUSES.

BY FRANK HOLYOKE, M.D., HOLYOKE, MASS.

THE case which I present is that of a woman, Mrs. F. C., forty-three years of age, to whom I was called on May 1, 1905, at 4 P.M.

I learned from her husband that at 1.30 P.M. she had been closeted in her bed-room with a woman who is known to have performed abortions by the injection of soap-suds through a fountain syringe, and within the womb. In the course of a few minutes he heard her cry out: "Come and help me." He rushed in to her room and before she could speak again she was dead. I found her lying on her back upon the bed, fully dressed, her clothing carefully arranged, her skirts, bedspread, etc., being water-soaked over an area three feet in diameter, and drenched to the mattress; but directly beneath the buttocks and the genitals was a light blood stain the size of a dinner plate, showing that bleeding had been very slight. Physical examination of the abdomen revealed what appeared to be about a six-months pregnancy, but on percussion over the uterus the sound was somewhat resonant, not so flat as we find over the normal, pregnant uterus. From the vagina oozed a blood-stained fluid. I ordered the body to be removed to the undertaker's warerooms, where an autopsy was performed on the following morning at ten o'clock, Dr. J. P. Shine, of Holyoke, assisting.

All organs of the body were normal except for the general, intense venous congestion everywhere, the blood being black and fluid, without a clot.

The lungs filled the pleural cavity and were deeply congested and edematous.

The heart was flaccid and empty, except that in the right ventricle was found about one ounce of black, fluid blood, filled with air bubbles.

On opening the liver, blood filled with air bubbles flowed from the cut surfaces, more especially from the left lobe.

On removing the calvarium and dura mater a large quantity of serum flowed. The brain was congested, and all veins in and upon the surface contained black fluid blood, filled with air bubbles. The large arteries were practically empty of blood.

Manipulation and percussion of the uterus, *in situ*, indicated that there was air within its cavity. The right Fallopian tube was distended with air to the size of my little finger, the fimbriated extremity of the same being adherent to the right ovary, and therefore closed. The left tube was absolutely normal and not distended with air, which was afterwards explained, on opening the uterus, by finding that the placental tissue lay over its opening.

The vaginal mucous membrane was covered with thin bloody fluid, and felt exceptionally wet. Hanging loosely from the neck of the uterus, within the

[1]Read before the Massachusetts Medico-Legal Society, June 12, 1906.

vagina, was a half-dram of jelly-like, blood-stained mucus, no mucus being found within the cervix, and the external os admitting the little finger.

That portion of the placenta lying near the internal os was torn, softened and partly separated from the uterine wall, showing the introduction of some hard instrument; while farther up, within the body and fundus of the uterus, the placenta was simply raised or separated (not torn) from the uterus, over about one fifth the placental area. On the left side of the uterus, and overlying the opening of the left Fallopian tube, the placenta was undisturbed. The membranes, containing a male fetus seven inches long, were unbroken and filled with clear amniotic fluid. The placenta measured five inches in diameter; the cord nine inches in length. A large air space was found between the amnion and uterine wall.

My reasons, therefore, for believing this to be a case of death from air embolism, introduced through the uterine sinuses, and not due to gas-forming bacteria, are: First, the very sudden death which occurred in a woman previously in perfect health; second, the use of a syringe containing air and water under pressure, the nozzle closely fitting the os; third, the presence of such a large quantity of air in the dilated uterus and Fallopian tube; fourth, the black *fluid* blood everywhere filling the venous system, the arteries being comparatively empty; fifth, the flaccid heart containing blood admixed with air, which was also found in other organs of the body; and sixth, the fact that no air was found in the placental tissue nor in the cord, nor in the fetus.

DEATH BY VIOLENCE. MANNER UNKNOWN.[1]

BY R. B. ROOT, M.D., MEDICAL EXAMINER, GEORGETOWN, MASS.

THIS case is one presenting some unusual features, and the exact cause and manner of death is, and doubtless will always remain, unsolved.

On the first day of March, 1894, I was called to view a body found in a brook, the brook being the outlet of Pentucket Pond in Georgetown. On arriving at the place I found the body of a man partly submerged in the water, the brook being but four feet wide and not over three feet in depth at this place — and it never freezes as the current is quite swift. My examination made at place where body was found revealed the following facts: A man six feet in height, weight about 175 pounds. His ankles were tied together with his suspenders — his wrists were tied behind his back with small but strong twine. Inclosed in a white pocket handkerchief and fastened to his coat button and opposite button-hole was a stone weighing 12 pounds. I removed the body to Jackson's undertaking rooms and on the following morning made a more careful examination and autopsy. There were no marks of violence on any part of body.

He was clothed as follows: Black overcoat, dark rough goods, marked "Allen & Co., Portland, Me."; black Prince Albert coat; black diagonal pants; dark woolen stockings; white shirt with trade mark, "Patent Reinforced H. & L. B."; turned-down collar, size 15½ inches; wristbands of shirt sleeves tied through each button-hole with white string, the string being tied over a piece of cardboard.

In his pockets I found a copy of the New York *World*, date of Dec. 3, 1893; a Boston *Globe* of Dec. 21, 1893, comb, pipe, T. D. shape, made of wood.

Decomposition was well advanced. There was a pronounced depression around left little finger as if made by a ring.

It was impossible to make a fully satisfactory autopsy on account of the stage of decomposition. Height, six feet, weight about 200 pounds, nearly black hair, eyes probably brown, on each wrist were deep depressions where cord had been tied. On right fore-arm there were in India ink a shield, flag and cannon, the print being three and one-half inches long and three inches wide. On removing skull no fracture was found, the brain very soft and anatomical land-marks gone. Lungs, right crepitant; left, pleuritic adhesions with what appeared like a partially collapsed condition, but post-mortem changes here, as elsewhere, rendered it impossible for me to judge as to the condition at time of death. Heart and pericardium normal. The stomach, kidneys and liver I sent to Dr. E. S. Wood for chemical analysis.

Jan. 19, 1895, Dr. Wood not having made return of his analysis and no clew

[1]Read before the Massachusetts Medico-Legal Society, June 12, 1906.

to identification of the body having been found, with the consent of District Attorney Moody, I countermanded my order for analysis of organs and made return of "Death by violence, manner unknown."

In reviewing this case there is one feature of marked interest: I spoke of his having his wrist-bands fastened with string through the button-holes and tied over a strip of white cardboard; certainly we must admit a most unusual method of securing one's wristbands, especially taking the trouble to tie over pieces of cardboard when it would have been much easier simply to tie with string alone. And when, a few days after discovery of the body, a rumor came to me that a laborer who was said to resemble this body left the Gregory farm in Peabody in the autumn, some three months before my view in March, and that just before leaving the farm, Mr. Gregory's little son had fastened the man's wristbands with string and cardboard, I felt sure that if such was the case, identification must follow, and though it is not the duty of the medical examiner to act as detective, I wrote to Mr. Gregory, asking if the report was correct, and if so, requesting his son to send me a piece of cardboard, cut as nearly as he could remember as regards size and also the same kind of string used. In reply Mr. Gregory wrote me that the rumor was true and inclosed what appeared a perfect duplicate of cardboard and string found at my view; this clew being followed up located this man as alive and well in Portland, Me. I think you will agree with me that it would be hard to find another man who had adopted so unusual a method of fastening his wristbands; and, taken together with the time of his leaving the farm in the autumn prior to the time of finding the body in the spring following, apparently about the length of time the body had been in the water renders it altogether a remarkable coincidence. In conclusion, it seems to me, in view of the mystery attending the death of this man, a verdict such as I rendered of "Death by violence, manner unknown" is perhaps as satisfactory as one more explicit, for the following reasons: Supposing the autopsy had revealed the death to have been from natural causes, why should he be found tied in the manner described in my report? Again, had I found the cause of death to have been one of violence, say a bullet wound, the question immediately arises, why take the trouble to tie a dead man hand and foot; and so the same question would arise had an analysis resulted in finding poison to have been present. My opinion is that when his ankles were fastened with his suspenders, he was, if alive, in such a condition as not to be able to resist as, on attempting to lift the body into a wagon, I attempted to lift by the suspenders but they parted, though I did not exert a strain of more than twenty-five pounds, and it seems to me that had he been conscious of the attempt to tie him he could have easily freed himself.

TRANSACTIONS

OF THE

MASSACHUSETTS

MEDICO-LEGAL SOCIETY.

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A CASE OF SUDDEN DEATH RESULTING FROM ABORTION.*

REPORTED BY OLIVER H. HOWE, M.D.,
Medical Examiner of Cohasset, Mass.

On Aug. 18, 1907, I was called to view the body of L. M. C., a young unmarried woman of twenty-seven, who had suddenly died. The history obtainable was very meagre. She had come to the house where she died, on the previous day, having told some of the people there that she had recently had a miscarriage. She was not considered seriously ill, but on the morning of the 18th she asked for a glass of water and on rising from her couch to drink it, suddenly fell back dead. A physician, Dr. F. L. Doucett, of East Weymouth, was hastily summoned and he asked me to view the body as medical examiner. No further history could be elicited, but there was on the part of all the household a studied reticence which excited suspicion.

On making an autopsy, the abdominal cavity was found to be full of pus and there were a few recent adhesions between the coils of intestine and other organs. The left ovary and tube were apparently normal, while the right tube was distended and distorted by recent inflammation and pus was exuding from a sloughing opening in the tube, which was the source of the pus in the abdominal cavity. The uterus was enlarged, the os dilated, and on section the endometrium presented a dirty grayish, shreddy appearance. A placental site with decomposed shreds of placenta was seen on the posterior surface. Just below the placenta was an abrasion of the mucous membrane one-half inch in diameter and an inch higher up and to the left was a smaller abrasion. On the right side of the os internum was an abrasion measuring one inch by one quarter inch, in which were two places somewhat deeply gouged. These abrasions, seen in the fresh condition, seemed to me to have been made with some instrument. The pelvic organs were removed entire and submitted to Dr. William F. Whitney.

The pericardium contained the usual amount of clear fluid and the heart was normal in size. The right auricle was distended by a large whitish thrombus of the size of a horse chestnut. The upper portion of the aorta contained a large red thrombus with branches extending into the principal vessels.

I consider that an infectious inflammation occurred in the uterus and right Fallopian tube. Rupture of the latter led to a purulent peritonitis which was the cause of death. The fatal result may have been hastened by infection of the blood and thrombosis.

From its legal side, I would state that this case came before the Grand Jury and the prosecuting officers felt reasonably sure who performed the abortion, but were unable to obtain sufficient evidence for conviction.

* Read at a meeting of the Massachusetts Medico-Legal Society, Oct. 2, 1907.

MUTUAL RELATIONS OF PROSECUTING OFFICERS AND MEDICAL EXAMINERS.*

BY HON. HERBERT PARKER,
Formerly Attorney-General of Massachusetts.

I COME before you to-day grateful for the opportunity that you have offered to me, and in the hope that in your presence I shall receive more enlightenment than I can give to you by any suggestions following upon the subject which you have assigned to me to speak upon.

I understand that a large part of the membership of this excellent and useful organization is made up of the medical examiners of this commonwealth. Doubtless you all know, who hold those offices, that you are not only expected to be able and learned and discreet men, but the statute specifically requires that his Excellency the Governor shall appoint to these responsible offices and authority only that type of men, so that you are embodied in the statute by that designation. Mindful, then, of the preliminary requirement for your assignment, and knowing the wide range of experience that your duties bring to you, I shall not assume to much instruct you, because much I fear of that I shall have to say to you will be along lines that your own thoughts have pursued, yet I entertain the hope that my own professional experience in my own service which I have attempted to render to the commonwealth may in some measure aid you in the performance of your own duties.

It is well, though each of you have taken the oath of office, though daily you are reminded of the lines along which your service must proceed, reminded of the great responsibilities that constantly rest upon you, yet it is well to hark back and bring again to our minds the precise phrase of the statutory authority that is imposed upon you; and in this connection to also remember what has been the evolution through statutory law which has finally resulted in the establishment of this great body of learned, professional men who are the medical examiners of this commonwealth.

In past years, as you know, in this commonwealth and in others, the inquiry relating to what was supposed to be a violent death, attributable or supposed to be possibly attributable to some criminal violence, became the subject of inquiry by a coroner and a more or less crude. inefficient examination through a coroner's jury. This method experience showed to be in many respects defective. Oftentimes it lamentably failed in securing the result that was to be obtained for the purpose of

* Read before the Massachusetts Medico-Legal Society at Boston, on June 11, 1907.

the maintenance of the law and the protection of human life. And so the system of medical examiners came into vogue.

A medical examiner is not in any essential degree a judicial judge, and the obligation reposed upon him in relation to the ascertainment of the cause or manner of death, in so far as it may affect any future medical proceedings, has been very properly, as I conceive it, limited, and the duty of the medical examiner is now a purely professional one, requiring of the medical examiner the utmost discretion in his preliminary inquiries as to the attendant physical circumstances, and, second, inquiring of the medical examiner the nicest and most scrupulous care in making the investigation, the demonstration and report of which in cases that involve homicide becoming the most potent, the most vital, indeed, the decisive factor, in the subsequent investigations conducted in the courts.

How, then, in view of the precise statutory duty defined by the law, shall a medical examiner proceed to make the investigation required of him? The statute, as you know, leaves it largely in his discretion whether or no an autopsy shall be performed, or whether he shall satisfy himself officially by a superficial examination of the body of the deceased or by such inquiry as to the attendant facts as may satisfy his own judgment of the case.

The statute says that the medical examiner shall, by such processes as he may adopt, determine the cause and manner of the death, and there, I think, is a provision which may lead to confusion. Now, I do not think it is as precise, as accurate, as it should be, and in this phrase or provision arises the first point which I desire to briefly discuss with you, — the cause and manner of death.

I conceive that the real province of the medical examiner, acting as a learned, medical man, surgeon and pathologist, is to determine upon physical propositions and through physical and scientific demonstrations the cause of the death. The manner of death I believe to lie largely outside both the inquiry and the responsible deduction or determination of the medical examiner, because the manner of death may lead to an inquiry as to fact and partakes rather more of the nature of a judicial examination.

The medical examiner, in my judgment, is not and ought not to be required by the statute to suffer his mind to be diverted from the inquiry, to which it should be confined, in an effort to determine who may be the guilty person or what were the circumstances precedent or antecedent or coincident with the death out of and because of which some criminal responsibility may attach to some person. The inquiry is, What is the cause of death? And with that the responsibility of the medical examiner ought to end, in my judgment.

If he is to consider himself as an investigator, as a criminal officer seeking to determine at the outset and before any full investigation can possibly be had who may be the guilty person, if the case be a death that involves the commission of a crime, the mental attitude of the medical examiner is disturbed. The possibilities for his prosecuting the work that is really and exclusively his own is much impaired. He ought not at any stage in his investigation and up to the time of the statement of his convictions be in any sense a partisan, a prosecutor or a judge of facts or of his fellow-man, save and except as to such facts as are involved in the demonstration of the cause of death.

The medical examiner in his relation to the prosecuting officer is an adviser, not in any sense a co-operating, prosecuting official. If he were such, this equipoise of mind, this absolute lack of prejudice or partisanship, would impair the service which the law requires of him.

With what attitude of mind, then, should a medical examiner investigate a case which is called to his attention, and how and in what manner and to what extent should he prosecute that investigation?

First, in what cases should he hold or advise the holding of an autopsy? The statute says that he shall advise so where he thinks, upon a preliminary investigation, such is necessary, where it is supposed that the deceased came to his death through violence. And what is the death through violence which the statute contemplates? I conceive it to be such a case of death as is possibly violent by any reasonable suggestion from attendant facts, both those which are revealed by the body itself, its position and all physical surroundings, and such information as by inquiry the medical examiner may secure.

The death by violence, having regard to the purpose which the statute must be supposed to subserve, is a death which, upon the actual facts as they may be later demonstrated, is due to some cause other than what we, for lack of a better term, call natural death, following or supervening upon some disease which brings it about through the inevitable processes of nature. If the death or circumstances coming to the knowledge of the medical examiner even reasonably suggests that the death has come through other causes, — among " other causes " being accident (which you may suspect, since accidents, for the most part, are involved in human action and suggest the possibility of some unlawful or such negligent human action as may possibly suggest or compel the suggestion of crime), such as an investigation which leads to the suggestion that the death may come through the hand or by the will of the deceased, which suggests, of course, suicide, and suicide in itself suggests that some human action brought about the death, and there always is the possibility that it might be by the act of the deceased or might be through the act of some other human being and so of human

agency, — in every case, then, where the circumstances or the superficial examination of the body suggest death as coming from any of these external causes, it is a case which justifies and, in my judgment, requires the performance of an autopsy. And why?

In so far as an examination of the body and of its organs discloses an abnormal and morbid condition and suggests a cause of death, the manifest conditions suggest and compel the holding of an examination immediately and forthwith, because in so far as these physical conditions, subject to decomposition and decay which render impossible further investigation in a short time, are the conditions out of which and from which ultimately and finally the truth must be determined, compel this careful, exhaustive, accurate examination. Oftentimes, not often, but occasionally, and several times in my own experience, facts later coming to the knowledge of the prosecuting officials or other investigators in regard to a death, which at the time seemed to suggest no real requirement for this physical examination, and which has been shown by the development of later inquiry and demonstration to have been a case where perhaps the safety of the community would have absolutely required this investigation, and for lack of which and because the opportunity and means for that investigation has gone, it has happened in several instances within my knowledge that a crime has gone without adequate investigation and the criminal has escaped even accusation and trial.

So for these reasons and a multitude of others which have doubtless suggested themselves to each one of you through your own experience, I advocate and urge the holding of an autopsy in every case where a reasonable suggestion of the possibility arises. It is better for every one, it is better for the community, it is better for those who are concerned through affection or relationship with the deceased, to have this examination made; and if it disclosed no reason to suspect this violence of which the law takes cognizance, then it is well that the truth is known and all suspicion is allayed. And if, as often happens, the attendant circumstances did seem to compel this exhaustive physical examination, yet oftentimes the examination itself has repelled and discarded by physical demonstration the apparent truth that seemed to exist from the superficial attendant circumstances and which was the justification for holding the autopsy.

Again, recurring to this dual duty that the statute seems to suggest and impose upon a medical examiner, the determination of the cause and manner of death,— I say the manner of death, if that involves an inquiry into exactly how, through human agencies and exactly under what circumstances death came, leading to an inquiry as to who might be the guilty person,— it puts the mind of the medical examiner in an

attitude and into an activity which impairs the accuracy of the performance of his real duty, namely, to determine what is the cause of death. The medical examiner should enter upon the determination of that question with his mind as absolutely open, awaiting the demonstration of the truth, as should be the mind of a judge who, sitting upon the bench, waits to hear the statement and the elaboration of the cause of the respective parties before him, without the slightest bent or prejudice toward a decision one way or the other. And if unconsciously a judge does not find himself in that attitude of mind, he is to that extent disqualified and is, I think, totally disqualified from sitting in the case.

A medical examiner, seeking merely for the truth, and striving only to demonstrate that truth, should proceed with open mind to that end. If, by hearing the stories of excited, prejudiced, hysterical or interested persons, he should suffer himself, thinking he has got to determine the manner of the death, to believe that this or that person, who may be the victim of the excited and ill-considered accusations of the crowd, surrounding, as they always do, an alarming and surprising death, is guilty and should find himself when he starts to make his autopsy in the frame of mind of one who believes a thing to exist and then proceeds to make his autopsy to establish and confirm a preconceived opinion, so, as a lawyer or judge who cannot keep his mind open cannot perfectly and fully discharge the particular duty that rests upon him, I believe that even the most upright doctor or surgeon, if he has formed an opinion as to what was the cause of death, cannot keep his mind absolutely open to detect and discover what was the real truth. Unconsciously in such a frame of mind he will ignore some revelation of his autopsy which perhaps ought to have been more rigidly and exhaustively inquired into, possibly, because we are all subject to error,— the surgeon, the lawyer, the judge and the theologian all are fallible.

So, gentlemen, it would be my suggestion, as, indeed, I think you must have all felt, that before you begin your autopsy you must eliminate from your mind any conclusion save such as is justified by obvious physical conditions upon the body as to the cause of death.

You all know and need no suggestion from me as to the exhaustive nature of this autopsy. You must remember that the prime object to be attained by it is the demonstration of the exclusive, primary, active, compelling cause of the death, and if you have found something that might suggest it, something which, if no other conditions actually obtained or were demonstrated, would suffice as an explanation of the death, you might stop there; but you would not have done your full duty for two reasons. First, because you have not absolutely demonstrated to your own moral satisfaction or absolutely demonstrated by any test that which you have found was the actual, compelling, im-

mediate cause of that death. And if you don't prosecute this inquiry further for the purpose of excluding all other causes, in the later stages of the inquiry, when you do become in a measure the associate of the prosecuting officer, you will fail him, you will fail yourselves, you will fail in the performance of the very duty which the law required of you, because inquiry, searching inquiry, by the attorney who has charge, being counsel for the defendent, will be made for the actual demonstration of the truth and the determining of who was the guilty person in the matter under investigation.

Your duty is simply to show that the cause has or has not been proved against his client.

The best of medical examiners occasionally rests upon the conditions at the time, noting only those things which were by him found that would or might be sufficient, and he is compelled to admit that certain investigations, the results of which might have impaired his conclusion, were not made. So stop at nothing until you have first found a cause, adequate, sufficient and conclusive to your mind, and then confirm it by the most exhaustive examination of all the vital organs and conditions of the body, so that you will have excluded any other cause and opportunity in making your autopsy.

If you are dealing with an exhibit which is lost to the case and lost to the inquiry within a short time after it is made (and with the autopsy itself the physical operations attending it oftentimes destroy the evidence which might have been of vital importance), you are dealing then with this human body, dead, which, associated with your testimony, is going to be the determining factor, perhaps, in a case which has appalled a community because of the horror of it, because of the mystery of it, because of the uncertainty that all feel where a mysterious crime has been committed in its midst, and the whole world, or that community, waits anxiously to learn whether the processes of human law are adequate to protect the law-abiding, to apprehend and punish the criminal. And, gentlemen, you medical examiners are of far greater importance to the community, your responsibility is far graver and more serious than that of the prosecutor in this regard. For only in so far as the demonstration resulting from your examination is convincing through the manifest care with which you conducted your duties, so is it convincing likewise because of the candor of your statement. Because, remember, when you are testifying on this most vital feature of a homicide, you are testifying before a tribunal of which the judges are a part and the twelve men sitting in the jury box are the most important part, because only as the truth through your statement is reflected upon their minds is the truth going to be manifest in their verdict. So that accuracy of investigation, care and precision in the statement of the testi-

mony are of vital importance, and if anything has been omitted, if anything has been left out which care could have furnished to the demonstration of the case, then, to that extent, you are at fault. The ablest prosecutor who has ever given his services to a community, the most carefully drafted laws, the most watchful judges, the most conscientious jurors, cannot by any processes or declarations of theirs establish the case if its demonstration be defective through any omission of yours.

Now, what should you state in your report on an autopsy conducted after such manner as you yourselves would conduct it? And I am speaking of these things rather of their intrinsic importance than because there is any need to remind you of them. But I do speak of them because my subject is "the mutual relation of medical examiner and prosecuting officer." And it is important and it is competent and material for me to emphasize to you the importance of your services in this respect.

You are not acting at the mere behest of a prosecuting officer. You are not furnishing to him that which he thinks is a necessary part of the demonstration of an accusation made against an individual. You are superior to any prosecuting officer. Your learning and your conscience are not his and not given to the commonwealth save as the commonwealth requires that you should demonstrate the truth so far as it is possible. But in order to do this duty it is required of you, and in order that you, co-operating with the prosecuting officer, may do that which the law requires by both, you are to keep constantly in mind, as you do, the importance of this phase of your service.

Now, how ought you to make reports, and how elaborate should they be? There should be nothing conjectural in them. There should be nothing in them by way of argument or suggestion of conclusion. There should be a mere recital of that which is demonstrated to you by the autopsy which you have made. You should say in your report that which is apparent, which is merely apparent. You should say nothing is evident when it is merely apparent. You should say nothing as a finding in your report that is dependent upon the accuracy of pure reasoning. The purpose and end to be served by your report is, so far as possible by mere descriptive words, the real, obvious, demonstrable facts open for investigation by the court, the jury and other learned scientists who may have occasion to inquire into this subject, that which you saw. For the report of an autopsy conducted by a medical examiner is and ought to be merely the perpetuation of that which if the body itself were accessible it would furnish. And here again I remind you that if you suffer yourselves to mingle with your report argument or suggestion of conclusion, then you have consciously

or unconsciously made yourselves partisans to a conclusion or an argument, and that is not your function. Say nothing in your report that is not demonstrated and finally demonstrated to a conclusion. Measure each word with extremest care. Weigh it, every phrase. Never, merely to avoid embarrassment, merely to avoid the apparent impairment of a truth which you have stated, use any phrase which either by reasonable or even cunning cross-examination may seem to have made you state that which you did not intend to state, or to state that which is inconsistent with the conclusion to which you are testifying in court. Because, of course, after you have made your report of what you have found, after you have demonstrated that which is demonstrated by an autopsy, you have merely furnished the data from which and from which alone you are permitted, properly permitted, to express an opinion, which may or may not be of vital significance in the determination of the case. No reasoning can proceed to a safe or a true conclusion unless it is founded upon absolute and correct data.

The medical examiner holds a peculiar professional responsibility to himself, to his profession and to the community. I don't share in any of the misapprehension that seems to be in large measure entertained by the public with regard to the reliability of expert testimony. The learned or the unlearned man testifying as to matters of opinion will be reliable or not according to the character of the man. That there will be persons who have sufficient professional or scientific knowledge to qualify themselves under the rules of law to give an opinion who may give false opinions for lucre or for gain (such men exist in all communities) does not impair the value, the compelling value, of the testimony such as you and I contemplate. But if, in the discharge of your duties as medical examiners, even unconsciously you suffer prejudice or partisanship, or even that most common sentiment in all of us, the eagerness to defend our own opinions, the eagerness to prevail in what seems to be under cross-examination a mere intellectual battle, and if through that inducement or through that selfish impulse you should refuse to disclose, even under the most hostile examination, or even at the expense of professional mortification, a truth which was made manifest to you but which escaped your attention, then you are, of course, unworthy of the profession you serve, unworthy of the duty you have undertaken with the public by reason of this office, and have done a great wrong not only to the person accused, but to the community, because the law has been diverted to false ends by such errors of yours.

Now, in speaking of this responsibility, in speaking of the gravity and solemnity that attend every feature of the discharge of your duties, I am not speaking because I have had from some years' experience any reason to distrust or deplore inefficient service of medical examiners,

but because, not in the words of compliment, but in the words of a lawyer sworn in his field to discharge his serious duties, as you in yours, I desire to bring to your attention the enormous importance to your profession, to yourselves, to the community, to the maintenance of law and order, of these duties which the statute imposes upon you.

In the commonwealth of Massachusetts there is a great body of men, you and your associates, I don't know how many there are, but a very large number of men, discreet, able, learned men, serving under a grave and solemn oath of office. You stand nearer the dividing line between law and violence. You are in this regard more nearly, more immediately and more responsibly the defenders and safeguarders of human life than lawyer, prosecutor or judge can be. Through your investigation, through your demonstration brought to a convincing conclusion in the minds of the twelve men, and, in the great majority of all homicide cases, upon that investigation and upon that word of yours depends the safety of the commonwealth. For if you be not able from the poor, mangled, dead remains of a victim of an atrocious murder to demonstrate convincingly, they will say, "Because no one saw him strike the blow," then all the evil-minded will say that because no one saw us we cannot be apprehended, and the greatest terror of crime, the fear of conviction, the fear of the penalties of the law, are removed.

I know of nothing more impressive, I know of no finer or nobler service that man can render to his fellow, than that which you do, serving not as the physician or surgeon ordinarily does, the keeping alive the spark of life in the enfeebled body, the saving by the most beneficent hand of surgery some victim who would otherwise go to a torturing death; but you, with eyes infallible in their search, with mind enlightened by the learning, the teaching of a splendid science which you have received, demonstrate from the organs, the lacerated flesh, the tissues of the dead, the truth, the living truth, which rises always from death, to be interpreted by those fitted to be its interpreters. Such you should be; such, thank God, gentlemen, you are.

CRIMINAL ABORTION.*

BY HON. GEORGE S. TAFT,
District Attorney of the Middle District of Massachusetts.

THE Massachusetts Medical Society resolved as long ago as 1858 that, when a physician "shall become cognizant of an attempt unlawfully to procure an abortion, either by persons in the profession or out of it, it shall be his duty immediately to lodge information with some proper legal officer, to the end that such information may lead to the exposure and conviction of the offender." (Proceedings of Massachusetts Medical Society, 1858, page 7.)

Last year a bill was introduced in our legislature (House Bill No. 247, 1906), the first section of which is as follows:

"SECTION 1. If a physician or nurse knows, or has reason to believe, that a person whom he is called to visit or to attend is suffering from, or has within sixty days preceding suffered from, an unlawful abortion, such physician and such nurse shall immediately give notice thereof in writing over his or her signature to the district attorney for the district in which such visit is made or such attendance rendered, and every physician shall, in a book kept by him for that purpose, make full and complete entries of the condition, from time to time, of such person visited or attended, and of his treatment of such person, and of the names and description of all persons caring for, attending or assisting in caring for or attending such person, and shall from time to time, upon request of the district attorney of the district in which such person has an office, or in which he resides, submit said book to said district attorney for inspection. A physician or nurse who refuses or neglects to comply with the requirements of this section shall be punished by imprisonment in the state prison for not less than three nor more than five years. If such physician or nurse be a woman, the imprisonment shall be in the county jail or in the reformatory for women."

This resolution and this bill must at least suggest to the physician who discovers that a criminal abortion has been performed upon his patient the question of his own duty in the premises. How far may the doctor who has discovered that such a serious crime has been committed justify a silence on the ground that his knowledge is derived through the confidential relation of physician and patient? How far may he justify himself in accepting as true the statement of his patient that her miscarriage came from natural causes without any investi-

* Read before the Massachusetts Medico-Legal Society at Boston, June 11, 1907.

gation to satisfy his suspicion that a criminal abortion has been performed? What is his professional duty and his duty to society?

These are really the more important and far-reaching problems which at once suggest themselves in any discussion of this subject, but I must content myself with a discussion of a few of the more purely legal aspects of the topic.

I suppose there are fewer prosecutions and fewer convictions of this crime, in proportion to the number of times it is committed, than with any other of the more serious crimes. Physicians are inclined to lay the blame for the few prosecutions and convictions to deficiencies in the statutes and to the technicalities of the law. Prosecuting attorneys, on the other hand, are inclined to the belief that abortionists escape prosecution because physicians do not obtain the evidence which it is peculiarly in their power to obtain, and often do not lodge it when obtained with the prosecuting authorities. I know of one case of this kind which occurred quite recently in a well-regulated hospital. A young woman was operated upon by a physician who has long been known as an abortionist. She called a physician in good standing to attend her and told him the whole story of the operation. He sent her to a hospital, telling the hospital authorities at the time that the patient had told him that a criminal abortion had been performed and who performed it. The patient was allowed to die without getting her to make a dying declaration and no report of the case was made to either the district attorney or the police authorities until after the girl was dead. An autopsy disclosed that there had been a miscarriage, but it was then too late to obtain any competent evidence of a criminal abortion, much less of who committed it. The girl's statement was made when she was not *in extremis* and consequently was not competent as a dying declaration. There is every reason to believe that if the information which the girl gave to her physician had been seasonably lodged with the district attorney or with the police authorities, either by the physician who sent her to the hospital or by any one at the hospital, the evidence could have been obtained which would have convicted the abortionist.

A little of the history of the crime in Massachusetts may be instructive. It is now defined by statute, which is as follows:

"Whoever, with intent to procure the miscarriage of a woman, unlawfully administers to her, or advises or prescribes for her, or causes any poison, drug, medicine or other noxious thing to be taken by her, or, with the like intent, unlawfully uses any instrument or other means whatever, or, with like intent, aids or assists therein, shall, if she dies in consequence thereof, be punished by imprisonment in the state prison for not less than five nor more than twenty years; and, if she does not die in consequence thereof, by imprisonment in the state prison

for not more than seven years and by a fine of not more than $2,000." (Revised Laws, Chapter 212, Section 15.)

It was also a crime well known to the common law. But the crime has been changed in many important particulars by the statute. (The common law, generally speaking, consists of the great body of the law as it has been developed by the courts of England and by adoption in this country, in contradistinction to the express statutes of the legislature.) The changes in the common law made by the Massachusetts statutes have not only created new offenses unknown to the common law, but have also made it much easier to convict offenders. By the common law it was not an offense to perform an operation on a pregnant woman, with her consent, to commit an abortion, unless the woman was quick with child. This was because, by the ancient common law, a child was considered to have an independent and separate existence, or, in other words, life began only as soon as the infant was able to stir in the mother's womb. This was decided in Massachusetts in 1845 where the opinion of the court was written by Chief Justice Shaw. (Com. *v.* Parker, 9 Met. 263.)

In consequence of this decision the legislature passed an act in the same year making it an offense to perform the operation on a pregnant woman, whether she be quick with child or not. (Statutes of 1845, Chapter 27.) It will be seen at once that this was a great step in facilitating convictions on account of the difficulty of the technical proof that the woman was quick with child when the operation was performed.

On the next revision of the statutes, in 1860, the words "then pregnant with child" after the word "woman" found in the earlier statute were omitted, so that thereafter it became unnecessary to allege or to prove that the woman was pregnant at all when the operation took place. Such has been the law ever since. In other words, it is the criminal *intent* that constitutes the offense in Massachusetts at present and it makes no difference whether or not the woman is pregnant at the time of the operation. (Com. *v.* Taylor, 132 Mass. 261.) Nor, indeed, is it necessary to show that the defendant "knew, believed, supposed or suspected" that she was pregnant. (Com. *v.* Tibbetts, 157 Mass. 519.) This, of course, was another step in the same direction.

Then followed a very important statute regarding evidence, to wit, the dying declarations of the woman were made admissible. (Statutes of 1889, Chapter 100.) By the common law dying declarations were admissible only in murder trials, they being then admitted upon the ground that the solemnity of impending death is equivalent to the solemnity of an oath in restraining one from falsehood. But they were admitted only when they might affect the life of a party accused of murder. But since the statute of 1889 the dying declarations of the

woman, as I have said, are made admissible evidence in abortion trials. This, of course, is an exception to the fundamental rule against the admission of hearsay evidence, that is, statements made out of court, not under the solemnity of an oath, and when the accused has no right of cross-examination.

This statute has played a most important part in the conviction of abortionists, as the evidence, when presented in such a way as to be competent, is most convincing to a jury, and at the risk of traversing very familiar ground I will allude to a few of the rules controlling it. The declaration to be admissible at all must be strictly a *dying* declaration and the admissibility always depends upon the view which the deceased took of her own case when in imminent danger of death. If she has any hope of recovery, however slight, and though as a matter of fact death ensues within an hour after the statement is made, it is inadmissible. If, on the other hand, the deceased believes she is dying, and has no hope of recovery, the declaration is admissible though death does not ensue within several days after making the declaration — in one Massachusetts case, seventeen days (Com. *v.* Roberts, 108 Mass. 296). This is a most important matter for every doctor to understand who is at all interested in this subject, as no doctor can tell how soon he may be called upon to perpetuate evidence which may result in a conviction which, without the evidence, would not be possible. No particular form of statement is necessary. It may be made orally by the patient, or it may be in answer to questions by the doctor and reduced to writing by him and signed by the patient, or it may be by signs as well as by words. It was held in one Massachusetts murder case that where the patient was unable to articulate by reason of wounds she had received and was asked to say whether the prisoner was the person who had inflicted the wounds, and if so to squeeze the hand of the interrogator, and she thereupon squeezed the hand, that it was admissible. (Com. *v.* Casey, 12 Cush. 417.) But in any case the patient must not only be *in extremis*, but must herself understand that she has no hope of recovery. I may add, by the way, that it sometimes happens that after the physician has fully explained to the patient that there is no chance of recovery and that death must surely ensue, all of which the patient fully understands, the patient proceeds to get well. I remember one quite remarkable case, when I was assistant district attorney, of an Italian who was sent to the Worcester City Hospital in the fall of 1901 with a bullet wound in the abdomen followed by peritonitis. When I went to the hospital to get the patient's dying declaration his condition was fully explained to him and the patient fully understood that there was absolutely no chance of recovery. A month or two later, when the matter had partly passed out of my mind, the patient appeared in the criminal court looking as though nothing had

ever happened. I remember that I was told at the hospital that the wound much resembled that of the late President McKinley. But I am digressing.

All these changes in the statutes make convictions in abortion cases much simpler than they formerly were and I suppose account largely for the fact that convictions are much more common now than formerly. I lately read a statement in a textbook that there were 32 trials for criminal abortion in Massachusetts in the years from 1849 to 1857 and not a single conviction. This hardly seems possible, and yet the author gives as the source of his information the Reports of the Attorney-Generals of Massachusetts covering those years. But I have not had an opportunity to verify the statement. And in a paper by Dr. E. G. Hoitt, of Marlborough, on "Criminal Abortion," read before this society June 9, 1896, he gives the history of 8 cases during twelve years of his service as medical examiner, no one of which resulted in conviction. This is in marked contrast to the results in Worcester County in the few years last past. In the only 4 cases actually tried there within the last ten years, the principals were convicted in three and in the fourth he defaulted his bond. In the same cases four accessories were convicted and sentenced. One accessory was acquitted, and as to one other the jury disagreed.

In Massachusetts it is not a crime for a woman to commit an abortion upon herself nor to submit to one by another. She is here regarded rather as the victim. The law is otherwise in England and in about a dozen of the states. (Reg. *v.* Fretwell, 9 Cox C. C. 152; People *v.* Mayers, 5 N. Y. A. R. 120.) This failure of the Massachusetts statute to make criminal the act of the woman in consenting to the operation has been frequently criticised. But her immunity sometimes renders possible the conviction of the abortionist. When she survives the operation the abortionist may be convicted upon her testimony alone (or now upon her dying declaration alone, in case of death), while if she were regarded as an accomplice in the crime, the rule of practise that a person may not be convicted on the uncorroborated testimony of an accomplice would prevent conviction where no other evidence was obtainable. (Com. *v.* Wood, 11 Gray, 85; Com. *v.* Follansbee, 155 Mass. 274.)

The subject of accessories is perhaps as important as that of principals in a discussion of this crime. It is seldom committed without the aid of accessories, either before or after the fact, and often both. The accessory before the fact is distinguished from the principal offender as one who, being absent at the time the felony is committed (to use the technical legal phraseology), "procures, counsels, commands or abets another to commit the felony." There is very often at least *one* accessory before the fact, sometimes the husband and sometimes the seducer.

It is often a difficult question for the district attorney to determine how far it is wise to allow the accessory before the fact to turn state's evidence and thus render more certain the conviction of the abortionist. It would appear from the reported cases in Massachusetts that this policy had very often been followed.

But the more important consideration for the physician is that of accessory after the fact. He is one who, knowing a felony to have been committed by another, "receives, relieves, comforts or assists the felon." I have already referred to the subject of the physician's professional duty and duty to society upon making the discovery that a criminal abortion has been committed. I now refer to his *legal* rights merely. Of course he may take care of the victim, and he is under no *legal* obligation to disclose what he may discover or suspect regarding an abortion. He may keep silent without becoming a criminal. When, however, he *does* anything to prevent the detection or conviction of the abortionist, he becomes an accessory after the fact. If, for example, he destroys the fetus, which often furnishes evidence of the abortion, or if he destroys the catheter or other means used to procure the abortion, with intent to shield the abortionist, he becomes an accessory to the crime. Accessories may now be tried and convicted, before there has been any conviction of the principal, although such was not formerly the law. (Revised Laws, Chapter 215, Section 5.) When, however, the abortionist is unknown to the physician, his purpose being to shield an unknown principal, certain legal difficulties to a conviction arise.

The above are a few of the legal principles involved in this subject, and the scope of this paper is limited to a discussion of them. The important inquiry, however, is not how far the physician may go without becoming a criminal, but rather what his professional duty is upon discovering that a criminal abortion has been performed, a subject to which I again revert by way of suggestion for further discussion by those better able to undertake it. An examination of the cases tried in Worcester County for several years last past reveals the fact that there has been only one trial where the woman has not died in consequence of the operation. (John W. Snow, of Athol, 1878.) Doubtless the greater part of the criminal abortions not resulting in death are never known to any physician. And yet the great rarity of prosecutions in such cases as compared with those where death results points to the conclusion that physicians make the disclosure in case of death and keep the secret when the victim recovers.

In Massachusetts, the confidential disclosures made by a patient to a physician are not privileged; that is, the physician may be compelled to testify to them in court. In about one half of the states the law is otherwise, though in such states it is the privilege of the patient and not the physician, and the patient may waive the privilege.

THE ALOIN OR GUAIAC TEST FOR BLOOD DEPENDS SOLELY UPON THE IRON CONTAINED IN ITS HEMOGLOBIN.*

BY WILLIAM F. WHITNEY, M.D.

In 1861, Van Deen first called attention to the fact that if a tincture of gum guaiac is mixed with a solution of blood coloring matter and then a fluid carrying loosely combined oxygen is added, a deep blue color is at once developed, fading away after a short time.

Aloin is another substance which gives a color reaction in the same way, only it is red instead of blue. This was first brought into notice by Klunge about twenty years later.

Because of their delicacy and ease of application, these two tests are employed in the preliminary examination of suspected blood stains. But their real value is chiefly negative, as it has been found that there are many other substances which give the same reaction. Therefore, if a suspected stain reacts with guaiac, or aloin, further tests must be made to prove that it is blood, while if it does not react it can be surely stated, without further testing, that it is not blood, at least, does not contain normal blood coloring matter.

The substances which have been found to react are iron and many of its salts, manganese, copper, gold and platinum salts, extracts of some plants, watery extract from leather or even flannel, and some kinds of filter paper.

Of these iron at once attracts attention since it is one of the constituents of the normal blood. Before, however, taking up that complicated combination, it would be well to try the delicacy of the reaction with the metal itself and some of its simpler salts.

I have chosen aloin rather than guaiac with which to show you these tests as it has the advantage of being somewhat soluble in water, while guaiac is not, and furthermore, the color which is produced does not fade so quickly.

First let us take the pure metal. A steel needle is broken into small pieces and one of these is placed in a porcelain dish with a little distilled water and allowed to stand for a few minutes. Then a little powdered aloin is stirred in, until the water assumes a light yellow color. A few drops of peroxide of hydrogen are added and a reddish color is soon seen to develop, most strongly marked at the broken ends of the needle or at any point where the polish has been removed.

Reduced iron and iron rust will act in a similar manner.

Of the salts of iron, the perchloride is the most active, for if a drop

* Read before the Massachusetts Medico-Legal Society at Boston, on June 11, 1907.

of a solution of this is added to a little aloin water the color change is immediately produced without the necessity of adding H_2O.

If, now, blood coloring matter is used, it acts like the metal in requiring the oxydizing agents to affect the change of color. The reaction in this case is extremely delicate and the coloration deeper and more beautiful. Why this should be I do not know, but from experiments which I have tried I am inclined to believe that the feebly alkaline character of the blood and the presence of chloride of sodium may possibly account for it.

But as yet no proof has been furnished that, in such a complex body as the coloring matter of the blood, it is the iron alone which is responsible for the reaction. This can be proved if the iron alone can be eliminated, leaving the rest unchanged, and no reaction should take place.

A brief consideration of what chemistry teaches about the coloring matter of the blood will show whether this is possible.

Hemoglobin is usually regarded as the coloring substance of the blood, but later investigations have shown that in the red corpuscles it is paired with another complex body, probably lecithin, forming what has been called arterin in the arteries and phlebin in the veins. But these are many unstable compounds, so that for practical purposes hemoglobin has only to be considered.

This, again, as its name indicates, is made up of a complex pair held lightly together. The first, a coloring matter, hemochromogen; the other a globulin.

Hemochromogen is not readily isolated, as it quickly absorbs oxygen to form the more stable substance, hematin, for which the generally accepted formula is $C_{32}H_{32}N_4O_4Fe$. The problem now is to remove the iron, leaving the rest intact. This can be done in the laboratory by treating with a strong mineral acid when the iron is taken from it and an iron-free coloring matter known as hematoporphyrin results. The reaction by which this takes place is as follows:

$$C_{32}H_{32}N_4O_4Fe + 2H_2O — Fe = C_{32}H_{36}N_4O_6.$$

But we do not have to go to the laboratory for this, as nature has furnished us in a constituent of the bile with a compound which has the same formula and if not identical with hematoporphyrin is isometrical with it and the bile in its reaction both with aloin and guaiac is absolutely negative.

After taking trional or sulphonal in overdoses, the urine assumes a deep claret color due to the formation of hematoporphyrin in the blood and its excretion by the kidneys. As yet I have not had an opportunity to make these tests in a case of hematoporphyrinuria, but I have not the slightest doubt but that they will be negative.

The coloring matters present in normal urine, which are regarded as derivatives of the blood, are without iron and give no reaction.

From the above it will be seen that the aloin and guaiac tests are not tests for blood, but simply for its iron and are utterly valueless for suspected stains upon any iron article, such as a knife blade, hammer or axe head.

Finally, it enables us to understand better why their chief value is a negative one and that the failure to obtain such a delicate reaction shows the absence of any normal blood coloring matter with its contained iron.

A CASE OF JUSTIFIABLE HOMICIDE.*

BY SILAS D. PRESBREY, M.D., TAUNTON, MASS.,
Medical Examiner, Second District Bristol County.

IN the evening of Jan. 17, 1907, I was called as consultant to Morton Hospital, Taunton, to see a man who had a bullet wound in his head. I found a large, powerful man, of middle age, with a large bullet wound in front of the left ear. He was unconscious, with slow and stertorous breathing, and had a very rapid and feeble pulse, which I was told was growing more rapid and more feeble. He had been shot at his home about one hour before my visit, and by order of his physician had been taken to the hospital. He died about two hours after my visit.

The next day I was called to take charge of the case as medical examiner. I obtained the history from the widow of the deceased, which was essentially as follows: About fifteen months previous he was injured in an accident on an electric car, suffering, it was supposed, a fracture of the skull. He was unconscious for about two weeks and ill for several weeks. He gradually improved and attempted to resume his duties as proprietor of a manufacturing business, but he was quite unlike himself and became ugly and abusive, especially to his family, and commenced to drink unreasonably. On the afternoon of the day of his death he came home considerably intoxicated and very abusive in his manner, went to his supper and soon asked his wife how she had succeeded in consulting a lawyer; she replied that she had not consulted a lawyer, but he said that he knew she had and that she lied, and he chased her to the kitchen and to the sitting-room, catching up a chair and threatening to kill her. Then the son, seventeen years of age, ordered his father to stop, but the father said he would not and chased her to the back hall and caught her by the neck. She pushed him off, but he grabbed her by the throat saying, "I will kill you."

The boy then rushed out to them and said, "I will shoot if you do not stop." He did not stop and the boy shot and his father dropped in a heap upon the floor. The boy telephoned for the police and for a physician, who ordered removal to the hospital. In the history the statement was made that since the original accident the man had lost his sense of smell.

AUTOPSY.

The autopsy was made at 10.30 A.M., Jan. 18, 1907, about twelve hours after the death, with the assistance of Dr. Charles A. Atwood, associate examiner, and Dr. Harry W. Miller, pathologist at Taunton Insane Hospital. Body of a large, well-developed man. Rigor mortis well marked. The only mark of violence found was a bullet hole just in front of the meatus of the left ear, measuring 1½ inches long and ¾ inch wide in the center. Edges of the wound and skin in its vicinity blackened and apparently burned. Direction of the wound, inward toward the right side of the body and upward toward the top of the head. The

* Read before the Massachusetts Medico-Legal Society at Boston, Oct. 2, 1907.

articular portion of the left condyle of the lower jaw was roughened by the bullet and the opening through which the bullet entered the skull could be felt at base of skull by finger in the wound. Abdominal and thoracic organs apparently in normal condition except that the liver was large and of light yellow-brown color and friable. The gall bladder was enlarged and distended with bile and an unusual amount of fat was found on the abdominal organs. Dura mater was generally adherent (to brain substance and underlying membranes), due probably to old pachymeningitis. There was subdural extravasation of blood over lower portion of surface of left cerebrum, of the cerebellum and even of the medulla. In the right cerebrum, opposite the wound of entrance, a considerable clot was found in the brain substance and extending over a large part of the right side of the cerebrum. In this clot the bullet was found, near the surface of the brain, and over the bullet there was a very small tear in the dura mater, but there was no mark on the inside of the skull. Comminuted fracture of the petrous portion of the left temporal bone, covering an area of 1½ inches in diameter. At the tips of the frontal lobes of the cerebrum (and on the under side) the dura mater was much thickened and strongly adherent to the brain tissue, and brain tissue at same point showed yellow softening over a patch ¾ inch in diameter. The olfactory nerves were involved in this yellow mass (these were considered to be the results of old inflammation).

Notes made by Dr. Harry W. Miller to supplement notes made by medical examiner, Dr. S. D. Presbrey:

Died at 10.30 P.M., Jan. 17, 1907, three hours after a bullet (32 revolver) wound in head.

Post-mortem examination began at 10.30 A.M., Jan. 18, 1907, conducted by medical examiner Dr. Silas D. Presbrey, associate examiner Dr. Charles A. Atwood and Dr. Harry W. Miller.

The examination of the abdomen and thorax was made by Drs. Presbrey and Atwood, but nothing of significance was found.

(For description of external wound in front of left ear see Dr. Presbrey's report.)

No other surface injury to head.

Skull cap normal. No positive evidence of old fracture.

The dura mater was slightly adherent over the upper surface. Much extravasated blood found over left side around the wound of entrance. (Condition at base of skull as result of bullet wound described in Dr. Presbrey's notes.) The dura mater at the under part of the frontal lobes anteriorly was very much thickened and adherent to the underlying brain tissue. This membrane at the anterior part of the longitudinal sinus was also thickened. The brain tissue immediately beneath this thickened membrane, at the under part of the frontal lobe, was in a condition known as yellow softening, a condition which indicates disease of some standing. These patches of softening were found on the under surface of both frontal lobes: on the left side reaching to the tip of the lobe, very close to the middle line, 4 cm. long by 1½ cm. wide (1⅝ inches by ⅝ inches); on the right side 2 cm. (⅘ inch) from the tip, irregularly circular, of a diameter of 2 cm. (⅘ inch). (Sections from both these areas and from the thickened dura were taken for microscopical examination.) Both olfactory nerves were im-

bedded in this chronic inflammatory mass and were both in an advanced stage of degeneration.

The wound of entrance was found in the left temporal lobe on the under surface 5 cm. (2 inches) from the tip and appeared as a rough, jagged, circular opening, full of clotted blood, 3 cm. ($1\frac{1}{5}$ inches) in diameter.

The anterior part of the cerebellum was partially torn by the bullet.

The wound of exit was found on the right side of the brain, a little behind the middle, 14 cm. ($5\frac{3}{5}$ inches) from the tip of the frontal lobe and 6 cm. ($2\frac{3}{5}$ inches) from the middle line. This wound was jagged, circular, 2 cm. ($\frac{4}{5}$ inch) in diameter, filled with clotted blood, and embedded in this clot the bullet was found. It caused a very small tear in the dura mater over the wound exit. The distance traveled by the bullet through the brain tissue was $14\frac{1}{2}$ cm. ($5\frac{3}{5}$ inches).

The ventricles were full of freshly clotted blood.

Weight of brain before removal of clots, 1520 gm.

Weight of brain after removal of clots, 1395 gm.

MICROSCOPICAL DIAGNOSIS.

Cerebral hemorrhage (gunshot wound). Gunshot wound of brain. Cerebral softening of frontal lobes. Degeneration of olfactory nerve.

I here insert an extract from a letter recently received from Dr. Miller: "I found significant lesions (excluding the bullet wound, which is described elsewhere) only in the lower frontal regions, i. e., in the under surface of the first convolution immediately external to the longitudinal fissure. The change in the tissue was of the nature of what we call softening or encephalomalacia. Granule cells were present in this area, the presence of such cells indicating that the process was going on for some time. Another evidence of chronicity was the chronic inflammatory changes found in the olfactory nerves, which had also undergone an atrophy. These changes were evidently of traumatic origin, the result of the street-car accident. The mental symptoms were quite consistent with the pathological findings."

Cause of death: Pistol shot wound of the head and lesions that indicate old inflammation due to former injury, which may have been a cause of mental perversion. The case was reported for inquest.

The boy who shot his father was arrested the night of his father's death and soon released on bail. The next morning he was brought before the First District Court and held without bail for the Grand Jury and remained in jail till the Grand Jury met Feb. 4 to 6, 1907.

The Grand Jury reported "no bill" and he was discharged.

The will of Mr. ——— was dated Aug. 20, 1906, nearly a year after the first injury, and at a session of the Probate Court, May 10, 1907, the will was disallowed.

The judge of the First District Court notified me that under the circumstances no inquest was necessary.

A REPORT OF TWO CASES OF POISONING BY WOOD ALCOHOL.*

BY A. H. PIERCE, M.D., LEOMINSTER, MASS.,
Associate Medical Examiner.

R. C. was an American about fifty years old, and, except for alcohol addiction, of reasonably good habits.

On Sunday, when drunk, he stole some " Colonial spirits " from the factory where he was employed. Through the day he drank a quantity of it, how much it was impossible to ascertain. He offered some to a friend, who took a few drams only, without disagreeable after-effect.

Monday morning he worked as usual. Monday afternoon he felt sick and remained at home. He complained of headache, dizziness, vomiting, abdominal pains, a burning sensation in epigastrium and behind the sternum, and muscular weakness. He would not allow his wife to call a physician. During the evening he fell into a troubled sleep. He awoke about midnight and found he was totally blind. I visited him about 2 A.M. Tuesday; he was in bed, tossing from side to side, complaining bitterly of pain and weakness and nausea and bemoaning his lost vision. His mind was absolutely clear; he told me he " was done for." His skin was pallid and dusky. The pulse was weak and rapid and of poor volume. His respiration was labored, but, as I recall it, not particularly slow. Probably the mental anguish was a factor. Suddenly a severe convulsion occurred and death ensued in a few moments.

No autopsy was performed.

The second case is one in which I was called to investigate and in which, by permission of the district attorney, I performed an autopsy. I quote from my official report:

The clinical history of the case was this; The deceased had had frequent attacks of gastric irritability in the past few years, manifesting themselves by nausea, vomiting, pain in the stomach and prostration. Intemperance in the use of alcohol seemed a sufficient cause for these attacks.

He worked steadily on Dec. 16, 17 and 18, 1906. He was feeling ill on the 17th and was worse on the 18th, complaining of epigastric pain and nausea and great prostration. During the evening of the 18th he became very restless, crying with epigastric pain and expressing his premonition of impending death. At 2.30 A.M., Dec. 19, he asked for a doctor. Dr. E. F. O'Malley, of Fitchburg, responded, reaching the patient at 3.20 A.M. He found him unconscious, but moaning as if in pain, with rapid, feeble pulse, pallid, sweating skin and with pupils widely dilated, but responding equally to light. Under stimulation his pulse improved, but at 4 A.M. his respiration became very slow (about 5 or 6 to the minute) and a deepening cyanosis preceded a convulsive seizure at 5.30 A.M., followed by a second at 5.40 A.M., ten minutes after which he died. No history of impairment of vision could be elicited.

Subsequent to the autopsy there was obtained from the deceased's wife a bottle of liquid from which he was said to have drunk voluntarily, on Dec. 16,

* Read before the Massachusetts Medico-Legal Society at Boston, Feb. 5, 1908.

about 1½ oz., diluting the same with water. No information could be obtained from his family of the source of this bottle. Chemical analysis by Prof. C. F. Nixon proved the liquid to be methyl alcohol, of the quality known as "Colonial spirits."

Autopsy Dec. 19, 9 P.M.: The body was that of a male, well developed and fairly nourished. Apparent age, thirty-four years. Height about 5 feet 8 inches. Hair and moustache dark brown. Rigor mortis and post-mortem lividity of back present. There were three old round scars ½ inch in diameter on the anterior surface of the left leg about 8 inches below the knee.

The usual incisions were made in opening the abdomen, chest and skull.

Abdomen: No excess of fluid in cavity, and peritoneum was normal. Slight swelling of many of the mesenteric glands. Liver, normal in position, size and upon section; spleen, normal; pancreas, normal; kidneys, normal; ureters, normal; gall bladder, normal excepting a few old adhesions along lower edge.

Appendix: One and one-half inches long, with adhesions and a constriction ½ inch from tip.

Stomach: This organ was tied off at the cardiac and pyloric orifices and its contents, about 4 oz., removed through a puncture into a clean jar. The stomach was then laid open. The mucous membrane was decidedly congested, the blood vessels engorged and with numerous hemorrhagic areas of small size.

Intestines: A similar condition extended along the duodenum and the jejunum and a short distance into the ileum, being most intense in the first portion of the duodenum and gradually diminishing in severity until lost.

Bladder: Normal in position, size and appearance.

Lungs: Numerous old adhesions over right and left upper lobes. Decided congestion of both lower lobes.

Pericardium: About 1 dram of pericardial fluid, a few old fibrinous flakes adherent to visceral and parietal surfaces.

Heart: Empty and normal upon section.

Brain: Dura normal. No increase in cerebrospinal fluid. Blood vessels of pia and subarachnoid space deeply engorged and with hemorrhagic staining of contiguous tissues in many places over cortex. A few adhesions about sylvian fissure near the central fissure. Membranes somewhat dull and grayish.

To recapitulate, there was present moderate gastro-intestinal irritation. grayish, cerebral congestion, moderate pulmonary congestion and dark, fluid blod.

These two cases give a vivid picture of the clinical aspects of severe methyl alcohol poisoning, viz., vomiting, pain in epigastrium and behind sternum, headache, prostration and disorder of cardiac action and respiration, followed by unconsciousness and death, either with or without convulsions. These are the predominant features in a fatal case. The occurrence of amblyopia is very frequent, but not constant.

In investigating the literature of the last five years upon this subject, I find the article of Wood and Buller, in 1904, and later, in 1905 and 1906, the work of C. A. Wood alone, contain all that we know of wood alcohol

poisoning. Their viewpoint, however, and, in fact, the viewpoint of almost all writers upon this topic, is that of the medical practitioner and that of the oculist.

From the standpoint of legal medicine little has been written which I could find beyond reports of cases, as, for instance, the very interesting paper of Dr. Hoitt, of Marlboro, a few years ago. So I have been interested in examining the literature of methyl alcohol poisoning for autopsy reports.

C. A. Wood states in 1906 that he has collected 156 fatal cases. I have been able to find accounts of 34 autopsies, the findings of which I have tabulated. This series comprises 21 cases occurring in this country and 13 occurring in Russian Livonia, the cases upon which was based the report of Ströhmberg. These cases, you will recall, followed the drinking, by Russian peasants, of a household remedy in which previously ethyl alcohol was the vehicle. No one knew how many drank of it. However, 13 died and 3 lived in total blindness. The bodies of the 13 who died were examined. The findings as reported by Ströhmberg form the best statement in the literature of the post-mortem appearances in methyl alcohol poisoning, and as translated and agreed to by Wood are as follows: Thirteen autopsies. The post-mortem lividity was a livid red, darker than in carbonic oxide poisoning, 12 out of 13. Rigor mortis well marked (10), goose flesh (10). Face, peculiar cyanotic color; distinct in 5, not so well shown in 8. Pupil of medium size in 8, in 2 much dilated, in 3 others unaffected. Mucous membrane of lips and mouth unaffected in 10; in 2, whitish. No odor of alcohol on opening cavities in these cases. Blood vessels of mucous membrane, of fauces, larynx and trachea injected. Heart relaxed in 12; in 2 ecchymosed areas on surface. In all instances (13) blood cherry-red, thinner than normal blood, but not quite as thin as the post-mortem fluid blood of asphyxia. Lungs hyperemic and markedly edematous. Stomach and bladder contents not characteristic. Mucosa of stomach hyperemic; in isolated patches in 6; ecchymoses in 4 or rose colored throughout; unaffected in 2 cases. Same condition in duodenum. Spleen (12), liver (10), hyperemic. Kidneys: Papillary and cortical substance congested and of dark color. Hyperemic changes of bladder lining, and vessels decidedly injected in 7 cases. Light uniform redness over whole mucosa in 3 other instances. In only one was it of normal appearance. Cerebral vessels filled with blood in all cases. Wood agrees with Ströhmberg that pulmonary edema, the peculiar condition of blood, congestion of brain and mucosa of bladder, post-mortem appearance of skin, isolated areas of injection in stomach, are the characteristic post-mortem appearance.

In view of the thoroughness of Ströhmberg's work we can but discount

heavily the statement of so many autopsy reports of negative findings. Such statements as "nothing of importance," "at the base of the brain 2 oz. of water infusion," "findings negative," etc., form a sorry contrast with Ströhmberg's record and almost nullify the value of the reports which contain them. For this reason 4 cases are omitted. Still, in all cases when the stomach and intestines were mentioned, there were found evidences of more or less irritation. In the 30 cases which can be considered at all (4 are absolutely worthless), the dark fluid blood is noted in 22 cases, and in none is it contradicted. Next in frequency is the involvement of the lungs, which is noted in 18 cases. In 7 no mention is made and in 5 it is stated that they were negative. The cerebral congestion is mentioned in 15 cases. In 8 no mention is made; in 3 the brain is said to be normal and in 2 there is a question, for instance, in the case with "2 oz. of water infusion." The unusual condition of the skin, unless expressed by "marked post-mortem lividity," is noted only by Ströhmberg, except that in one of Hoitt's cases there is mention made of this dusky livid appearance of the face. No one in this list notes the unusual appearance of the bladder mucosa except Ströhmberg.

This series of cases is a small one but contains all which could readily be found. It is sufficiently large, however, to define the usual post-mortem appearance in methyl alcohol poisoning and also to point out the moral that observation cannot be too keen and autopsy records cannot be too carefully made. I believe it likely that more careful observation would have shown in my own case that there was slight passive congestion of all the abdominal organs and that the mucosa of the bladder was hyperemic. It will thus be seen that two conditions combine to form this picture. One is a gastro-enteritis of varying severity, the local effect of the poison. The other is a passive congestion of lungs, brain and of various other organs and a peculiar colored fluid blood. The degree of this congestion probably depends on whether death was due to asphyxia in convulsions or in paralysis of the respiratory centers.

In regard to the bladder's condition I have found no record of cases in this country of any abnormality even where its contents are noted to smell strongly of alcohol. If an error in observation, it is remarkable in the uniformity of its occurrence. Is it not as likely that some other substance in the decoction used in Ströhmberg's cases caused this appearance? It is quite possible that corroborative evidence exists of which I am unaware, since Dr. Wood endorses this statement of Ströhmberg's. The odor of methylated spirits is not infrequently present, it having been noted by one observer in blood, lungs, urine, stomach and brain.

With the free use of denatured alcohol which has just begun in our country, the occurrence of wood alcohol poisoning will become rare again, perhaps as rare as in Great Britain and the Continent, where, until 1904, only 3 cases were described. So to the *future* student it will appear that for a period of from fifteen to twenty years there was an epidemic of methyl alcohol poisoning and that a condition very rarely noted previous to 1890 has again become a rarity. In other words, clinical material in this subject will soon be extremely scarce and it should to-day be collected in every possible way.

To resume, the post-mortem appearances are:

1. A hyperemic and usually hemorrhagic condition of the stomach and intestinal mucosa.
2. Dark cherry-red fluid blood.
3. Pulmonary congestion.
4. Cerebral congestion.
5. Hyperemic changes in the bladder mucosa.
6. Peculiar red lividity of skin and dusky facies.

A CASE OF DEATH FROM THE ELECTRIC CURRENT AS A RESULT OF TURNING ON AN ELECTRIC LIGHT.*

BY FRED E. JONES, M.D.,
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THE case I am going to speak of is somewhat similar to the one presented by Dr. Paine, — a case of accidental electrocution, which took place on March 12, 1904. W. S., Junior, the man who was killed, was twenty-one years of age, and worked in a machine shop. He tended a small forge. He stood upon a gravel floor, but the gravel was mixed with considerable iron from the constant chipping of the metal. The forge was made of brick, and about four feet behind the forge was a wooden partition. He ordinarily, and at the time he was killed, stood between the forge and this partition. Over the forge hung a sixteen-candlepower, 110-volt incandescent lamp.

The ordinary incandescent lamp is sixteen-candlepower, 110 volts. The candlepower of the lamp may be changed, — it is often ten, eight, six, four, two or one. The voltage is always the same on these ordinary house circuits.

This lamp which he used furnished sufficient light for his work. On returning to work at 1 P.M., he apparently reached for his light to turn it on. His sudden cry startled his fellow workmen. They rushed to him. He was then rigid, and his body was extended. He was leaning against the iron bars and the partition behind him. The lamp was attached to the rafters overhead, and was tightly clutched by his hand. The contact being broken, he fell to the floor.

Efforts made to resuscitate him by means of artificial respiration were unavailing. It is supposed that death was instantaneous.

A physical examination showed that he was a well-developed young man, weighed 140 lbs., and was five feet eight inches in height. Examination of his hands showed a burn extending from the back into the middle joint of the right forefinger. All the middle joints of the fingers on the back of the hand were burned free of soft tissue.

There is no history of any disease or accident in the past to impair his general health, particularly his heart, as far as could be ascertained. He was a man of good habits, and addicted to no excesses.

An examination of the wires of the building showed two wires which carried to and fro 110 volts of electricity to light the electric lamps. These lamps were hung on cords which tapped the main wire in the

* Read before the Massachusetts Medico-Legal Society.

rafters. A careful examination showed that though the lights have been installed several years, there was nothing out of order. The fuses were in place at the entrance of the wires into the building, and in each lamp itself.

In explanation I will say that these fuses are made of soft metal, which burns out when a sufficient number of amperes go through them. It is said that the metal, after aging, becomes less resistant and allows the electricity to flow through without burning it out.

A careful examination of the lamp which he held in his hand was made. An incandescent lamp is screwed into a little brass socket. A current of electricity sufficient to jump through the lamp socket in amount sufficient to kill must have exceeded greatly the 110 volts the wires were supposed to carry.

In the vicinity of the building were wires carrying a higher voltage. The fire alarm and telephone wires carry a low voltage. Street car wires carry a current of over 3,500 volts; and wires from the station to the transformers carry at all times about 2,300 volts.

Under these circumstances, only these last wires at this time of day could have killed this man. The wires from the building led to a transformer several hundred yards distant. This transformer reduces the current of electricity to 110 volts. This 2,300-volt current in some manner was connected accidentally with the 110-volt wire. This is a very similar electrocution to the one Dr. Paine has reported.

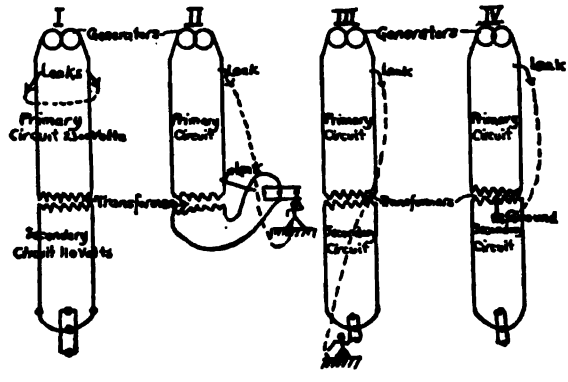
A professor of electrical science intended yesterday to be here to report the probable cause and possibility of prevention of similar electrocutions. He has been called to a case in court and is unable to be here. In order that we may not lose the lesson taught by these electrocutions, I shall present the subject as I understand it from the interviews I have had with him.

The electricity commonly used in our houses should be guarded by every reasonable precaution. The system of electric installation used in the two cities in which these electrocutions occurred is the same. The system employed in the city of Boston is an improved system whereby these accidents may be prevented.

I have here four diagrams. No. 1 shows the installation in vogue in the two cities where these accidents occurred. No. 2, the way in which Case I met his death. No. 3, the way in which Case II met his death. And No. 4 shows the improved installation whereby such accidents may be avoided.

No. 1 shows G, a generator at the station where the power is manufactured; A, the metallic primary circuit going to the transformer, which is a large box situated on the poles in the street, as a rule. In this transformer are two currents, — a coil of small wire of long distance,

and a coil of coarse wire of short length; 2,300 volts are supplied on this wire from the station. There is an alternating current flowing back and forth. The wire is insulated in every part from the ground, so that ordinarily no current escapes from it.



A current is induced in this coarse wire coil by the fine wire coil, which reduces the voltage brought to the transformer to 110 volts. One hundred and ten volts is the voltage ordinarily used in lighting incandescent lamps, and is a safe voltage for people to handle. That current may pass through the body without any alarming results. And this induced current is called a secondary current. The secondary current branches out to various houses, and is the proper current by which they may be illuminated by incandescent lamps. This would serve the purpose admirably were it not for the fact that the electricity escapes to earth if the proper opportunity offers.

By various means, such as the limbs of trees rubbing against the primary wire, the opportunity is offered for it to escape. This, however, it may not do. Electricity, like water, flows along the lines of least resistance; but if another leak or ground in the metallic circuit occurs, it will flow from one leak through the earth to the other leak, as in Diagram 1.

In order to produce a sudden loss of electricity, two grounds must take place. I would call to your attention this series which represents three incandescent lights, showing how the power is brought to the transformer through a wire and back to the transformer again — making a complete metallic circuit. As I said before, if two leaks or grounds occur, the electricity will flow from one leak through the earth to the other, there being less resistance — a shorter and easier path back to the generator.

No. 2 shows this condition, which probably was present in Case I. One leak or ground occurred somewhere, — say, for instance, a tree

may have caused loss of current on that side by rubbing against the primary wire. Dr. Paine told us that a heavy voltage wire sagged on to the secondary wire which carried light to the different houses.

This condition would take place, — that the line was simply waiting to make a second ground, and if anything came in contact with the secondary wire so that the ground could be formed, the electricity would flow rapidly from one leak through the ground to the other — a shorter and easier path back to the generator.

Now, we have in the diagram the man who was connected with his telephone. It was mentioned how the fuses blew out. When contact was first made, those fuses had to blow out; then the electricity went to the earth, for by taking hold of the electric light and his telephone he would then make a current through his body to the telephone. That would cut out the whole transformer. It would absolutely drop through him.

It only takes four or five amperes to kill a man. I think eight are used to execute a criminal. The victim made the second ground by contact with the incandescent light.

No. 3 illustrates the possible cause of death in Case II. The coils in the transformer, through poor insulation or other cause, may allow the primary current to flow on the secondary wire. The ground may take place between the two coils. Then the 2,300 voltage current is allowed to flow on the secondary wire. It will not do this, however, unless a second ground is formed — which is shown by the fact that at the time of the accident the lights were all burning. They will not burn with a current of 2,300 volts, only with 110 volts. They were all burning well. I tested them myself — though I would not have done so if I had known the danger. I remember they were turned on.

Then this man reaches for the electric bulb and forms connection with the earth. The electricity flows to the earth, through him, back to the original ground.

Both accidents were caused by two grounds whereby 2,300 volts of electricity passed over the secondary wire.

No. 4 illustrates a device by which such accidents may be prevented, if the secondary wire is purposely grounded at the transformer. The electricity would then escape by the intentional ground, as shown by the dotted line (in diagram), absolutely preventing escape of electricity over another ground on secondary wire.

Now, if there is a ground on the primary wire, and the electricity gets on to this secondary wire in any manner, it will immediately flow down this purposely-made ground to the earth at the transformer. No flow can take place outside of the transformer, so that the secondary

wire circuit is practically safe if the ground is at the transformer. If the 2,300 volts should get on to the secondary wire it would immediately go into the earth at the transformer and nobody would be affected. The electricity would escape by the intentional ground because a person would offer more resistance than the intentional ground.

With this device in operation, if a primary wire did cause a heavy current to pass over a secondary wire, the electricity would escape by the intentional ground, though it would cut out the whole line until the leak stopped of itself or was stopped by the company.

Amperage is the amount of electricity which flows on a wire. Voltage is the quality of it. If an excess of amperage flows over that wire, the circuit breaker breaks the circuit right off. That, of course, will shut out the whole line. It makes it awkward at times, but in this system, no matter where the grounds take place, they cannot affect the secondary current.

There have been objections raised to this grounding of the transformer. The chief one, I think, is the fact that electricity is lost. This would be the case particularly in the country where grounding from trees is more common. It has been advocated, by opponents of the system, that there is more danger from fire by its use. But it is a system used most commonly in Boston to-day, and I don't think that it would be used so much if the danger from fire were great.

Feeling it to be the duty of a medical examiner not only to assist in the detection of crime, but also to safeguard life in every possible manner, I have presented this subject to you, though I fully realize how little I know of the subject, and how little you may have absorbed from my explanation of it.

WHAT ARE THE LEGAL RESPONSIBILITIES OF THE EMPLOYER IN CASE OF THE "ACCIDENTAL" DEATH OF THE EMPLOYEE? *

BY J. C. FRASER, M.D., EAST WEYMOUTH, MASS.,
Medical Examiner.

THIS paper is one that might appeal, properly speaking, more to the members of the legal profession than to those of the medical, but as law and medicine are intimately connected in such cases, I take the liberty of discussing the subject in a brief manner from both standpoints.

An accident, according to the definition given in the Standard Dictionary, is "anything that happens, an occurrence, event, anything occurring unexpectedly or without known or assignable cause, any unpleasant or unfortunate occurrence that causes injury, loss, suffering or death." No doubt many of the accidents that result in death come under the head "without known or assignable cause" and are accepted by the public, and I presume always will be. But the word is a misnomer. Strictly speaking, it should be defined "an occurrence due to carelessness or ignorance," but in our present state of knowledge of things this definition would not be accepted by the courts in every instance. While it is true that justice is done the injured plaintiff on account of the carelessness or ignorance of the defendant, it is also true that many cases rest with the injuries being attributed to "without known or assignable cause" and, therefore, are accepted as something that could not be helped. We know, however, where injuries are received, that such conditions should not be taken for granted. Where palpable danger exists, is plainly observed day after day, is allowed to continue indefinitely without any attempt at correction until something happens, the occurrence should not be attributed to "without known or assignable cause," but to carelessness or ignorance, whichever it may be.

The employer, in his capacity as such, is bound in right and justice to surround the employee with all known safeguards against accident. His supervision should not be confined alone to the varied and complex mechanical devices and methods of operation in which danger lurks, but also to the surgical and medical attendance of the injured when such services are guaranteed and advertised by him. In the former the first law of nature demands of him the exercise of intelligent endeavor in such methods besides the avoiding of all means and circumstances that are liable to produce injury to the party in the proffered contract.

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In the latter, in order to fulfill faithfully his self-imposed obligations, he should provide all necessary requirements, both surgical and medical; he should provide surroundings where the exigency of cases could be met on the plane of advanced surgery and medicine, and he should have men skilled in *both* to aid in any emergency.

The employee on entering upon a contract for his labor in enterprises in which some danger is clearly manifest does so without any compulsory advances on the part of the employer, and this is a voluntary act on his part. Yet he enters into it with the reasonable assurance that the employer has instituted conditions that appear to him, in his knowledge, sufficient to obviate possible danger when due care is maintained. Again, when he becomes a party to this contract, he is assured that all necessary surgical and medical assistance will be rendered when occasion requires, and thus enters on his work conscious that he will be taken care of if he does meet with an injury.

To show that these guarantees are not always fulfilled by the employer, I will introduce one case illustrative of the point I wish to make.

The case occurred a few weeks ago in the works of one of the largest manufacturing industries in the country. The concern employs four or five thousand men, has a small building that it calls " the hospital " and has a medical man in attendance. J. W., an employee, was engaged in moving a plate from one part of the shop to another by the aid of a 25-ton crane. In order to do so he had to place two hooks in position in the plate. When this was done he was obliged to stand upon it to steady it. Just as the crane-man was about to lower it, it slipped from the hook at one side to the foundation, leaving the plate suspended by one hook at an angle of about 45°. In an attempt to save himself he caught the sling to which the hook was attached, which swung him into the hole in the plate, three feet in diameter, his belly striking the edge with great force. He was picked up unconscious, carried to the hospital and kept there until he regained himself. Then he was sent home to a neighboring town in an electric car, with instructions to call a local physician if serious symptoms developed. That night, about eight hours after the injury, a local physician was called, to whom was *not* made clear the serious nature of the fall. According to the report of this physician the only things in sight were a quick pulse, a slight rise in temperature and a soreness in the abdominal muscles. There were no marks that could be seen with the naked eye. He saw him again the next morning and the conditions were then about the same as on the previous night. The following morning at four he was called and found the man dead. He notified me at once, saying he could not determine the cause of death. I performed an autopsy that evening. The body was well nourished and well developed. The only marks of violence on the exterior were three faint discolorations on the abdomen, one circular, 2 inches in diameter, immediately below the umbilicus; one the size of a 25-cent piece 6 inches to the right and in line with the former, and another of the same size and 2 inches below the latter. The tissues of the abdominal walls contained gas. On opening the belly about a pint of thick reddish fluid

was found, the omentum was highly injected, the bowels were agglutinated by recent adhesions resulting from an acute general peritonitis, due to an escape of fecal contents from two ruptures in the jejunum, 6 inches apart and on the anterior surface; one, one-half inch in extent, the other 1-inch. The left lung was tied down by old pleuritic adhesions. All the organs were healthy. Death was due to an acute general peritonitis, primarily the result of the fall.

An inquest followed and I was asked by the court this pointed question, "If an operation had been performed, would the patient have lived?" I gave the only answer that a man could give to such a question, but we all know that when that man became unconscious it was due to the shock from the severity of the blow and that something serious had happened. We also know that the proper thing to have done would have been a quick laparotomy, and since the lesions were small and on the anterior surface, the operation would not have been a long or difficult one and the patient would have had a mighty good chance for recovery.

It is not my intention to criticise the judgment of the corporation physician in sending him home, for I believe he did not realize for a moment the gravity of the situation. Even if he had realized it and had been competent to perform an operation of that kind, the facilities and surroundings maintained in the building are not what they should be for such an operation. I know that I would not voluntarily consent to have *my* belly opened in an atmosphere contaminated by the odors and filth of men from nearly every nation on earth, who daily come in there to have minor injuries dressed and looked after.

This case proves that the employer did not offer the employee a chance for his life and, therefore, should be legally responsible for this sin of omission. From what has been stated it appears to me that he should be bound by statute to maintain a fully equipped ward, separated from the every-day surgical room, for all capital operations and serious emergencies where prompt action is imperative.

In the *Journal of the American Medical Association* of Jan. 11, appeared an editorial, the substance of which is as follows: The medical examiner, instead of confining himself to a bald summary of the number of cases and the causes of deaths which come under his official cognizance during the year, should make suggestions and recommendations which, if adopted, would diminish the number of fatal accidents. The above sentiment, I believe, is correct and should be religiously followed in every case where it appears to him that there is neglect on the part of the employer in instituting proper safeguards for his men while at work and where proper and adequate facilities are not provided to enable the surgeon to accomplish the best work that surgery can do for man. This suggestion could apply only to those corporations that exact a weekly stipend from the employee to be applied to the support of the

hospital of the concern and where each contributor is supposed to receive surgical and medical attention when occasion requires.

Up here at the State House committee-men have been engaged for months upon a bill which they are ready to report, if they have not already done so, — a bill to the General Court patterned after the Workingmen's Compensation Act of England, which provides a graded compensation for specific injuries sustained by the employee. If to that bill were added an article which would provide that all corporations that maintain a hospital at the expense of the employee should be compelled to provide suitable and up-to-date means which would enable the latter to receive the full benefits of intelligent surgery, many lives would be saved.

This case demonstrates that the employer was negligent before and after the injury. The plate upon which the man stood should have had four hooks instead of two, a matter that was fully realized all along by the workmen, who claim that the additional mechanism would not have interfered with successful operation, while it would have assured perfect safety. What happened after the injury has been told.

I believe that something ought to be done through legislation to lessen the number of accidents in the works of these corporations; I also believe that the medical profession should do its part by determining a suitable bill for presentation to the legislature, embodying the serious responsibilities of the employer in the care of the workman after an injury has been received. Such a bill should specifically determine that corporations should establish and maintain fully-equipped hospitals, adequate for the purpose, in charge of one or more competent surgeons. If this were accomplished the medical examiner would be called upon less often to report the stereotyped phrase " due to accident."

To bring this about I know of no society or body of men from whom such a bill would have more influence than from the Medico-Legal Society of Massachusetts, whose members have always shown marked interest in discharging all the duties that pertain to their office, guided by the best intelligence God has given them.

THE PHYSICIAN AS AN EXPERT WITNESS.*

BY FRANCIS W. ANTHONY, M.D.,

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THE law assumes that physicians and surgeons of practise and experience are experts in medicine and surgery. The question at once arises, What is an "expert"? It is thus defined: A professional witness, a skilfully practised person, one who has skill, experience or peculiar knowledge of a subject of inquiry.

It is evident that the assumption made by the law is often an assumption not corroborated by fact. It is also true that experts are not of uniform knowledge. There is a marked difference between the expert as regarded by the law and the specialist, well trained in a given branch. There must of necessity be also all grades of ability and knowledge even among specialists. True, the law allows, and, in some cases, insists that the qualifications and fitness of an expert witness be gone into; that, on the one hand, the judge may determine the propriety of his testifying in the capacity in which he is offered, and, on the other hand, that the jury may, by common sense, weigh him that they may give to his evidence its proper value. And, still, such an examination, while tending to establish the fitness of the witness to testify as to special lines of medical knowledge, does not always establish the value of his testimony when the question is one of medicine, but not of a restricted branch.

Moreover, many a man competent to care intelligently for the sick, and to form an intelligent opinion, is a poor witness. Details of anatomical, physiological or bacteriological knowledge may be gone from him, and he may be unacquainted with many of the recent methods of examination and research. He may be unused to the rigid rules that regulate the giving of testimony, and not versed in the traps of the shrewd attorney at the bar, in comparison with which the traps on the highway are but open ground. His training has been by the bedside; he is ingenuous and open, or, perhaps, too anxious to explain and to talk, not experienced in the giving of concise, terse opinions. Still, to most physicians at some time, and to many of us frequently, comes the necessity for giving expert testimony. It is commonly believed that medical opinion can be bought. In two branches of medicine this seems to have an appearance of verity, and yet, in justice, it must be said that in these two branches there is so much that is intangible, so

* Contributed to the Symposium of the Medico-Legal Society on Medical Expert Testimony.

that it has been in the experience of some attorneys of high rank to refuse to defend, to the extent he desired, a man whom they fully believed to be a criminal, only to be convinced later that the gentleman who did defend him proved him to be innocent and prevented a miscarriage of justice. I am not referring to careful probing or close examination to bring out all points of view and to learn the truth. I am referring to attempts to *distort* truth. And all of you who have had much court experience are aware that this is done. The public has come to look for it and to expect it. Theoretically, the district attorney who does not attempt to bring to light every fact bearing on a criminal case, whether this fact be for or against the accused, is no longer a prosecutor, but a persecutor. Theoretically, the attorney for the defendant who consciously and knowingly tries by catch questions and underhanded means to discredit testimony that he believes to be true is a disgrace to humanity and to his profession. Please bear in mind the restrictions I have first made; honest search and probing is to be commended. Pray do not misunderstand me. The bar has many men, some of whom I am proud to call my friends, men who not only are well-equipped mentally, but are also possessed of an ethical sense fully developed. Shrewd, keen, ingenuous, thoughtful, they are ready to do their full duty by their clients, but not to lower themselves while in court.

It is not for a non-legal mind to suggest measures of relief for such unfortunate conditions as may exist in the legal profession. I will say, however, if properly in judicial procedure the judge sitting in a case could often use the big stick as I have sometimes seen it used, many a physician would be spared humiliation and some attorneys be taught the fear of God and a regard for the common decencies of life.

Because of the methods, however, of many attorneys of reputation, it is difficult to express in court one's real opinion, hence the medical witness is forced to tell half truths, answer in monosyllables and reply to hypothetical questions framed to mislead, and unless he be versed in the art of self-defense in cross-examination in court, his only salvation is the shrewdness of the attorney on the other side, who, bright as he may be, is not medically trained. I make this statement with the full knowledge of the fact recently stated by an attorney of high standing that no honest witness, medical or otherwise, has anything to fear in court if he tells the truth and does not attempt to magnify a minimum amount of knowledge. Who of you that has been in court many times is not well acquainted with the well-worn question, "Now, doctor, you have testified that such and such things are customary and usual; now is it not possible," — and then follows a statement that you know is impossible outside the dreams of an hysteric. And yet an answer to such a question must be all framed, as I have one framed, if the physi-

cian is to give to the jury his real opinion. It should not be necessary, however, to invent a method of reply that shall convey the real opinion of the witness to the jury. The physician not accustomed to legal technicalities is often helpless in the hands of a shrewd attorney. The above is but a single instance of the well-known trap questions that are at the tongue's end of nearly every practised lawyer.

To do away with the opprobrium attached to expert testimony, different methods have been suggested. The appointment of experts by the court on the request of either counsel or by his own initiative is impractical, first, because the court is not cognizant of different trends of minds in experts; second, because the state compensation would be inferior to that offered by private corporations and individuals; third, because the lack of opportunity to cross-examine such *ex-parte* expert would often cause a miscarriage of justice.

The selection by medical societies of a list of physicians who may be called upon by the court as expert witnesses opens a field for medical politics which to-day, in other lines, often puts not the best fitted men in positions of honor and responsibility. My own views of this subject are well known in Essex County. If two physicians meet in a court case and examine it exactly as they would a private patient, openly, giving and receiving the best that there is to give and receive, there is no difficulty in 999 cases out of 1,000 in agreeing upon all questions of fact, of coming close to agreement on questions of opinion, leaving open the opportunity, so vital to the interests of litigants, of stating honest differences of opinion to the jury, thus allowing them to be the ones to ultimately decide the question at issue as the law provides. This is not a theory; it has been proven by trial. It stands in the way of no other method. In northern Essex county it has been adopted by the branch of The Massachusetts Medical Society and almost universally by the practitioners in that section of the state. I am informed that other district societies have also adopted it. Let me illustrate by a suppositious case on the civil side, one of that trying group of traumatic hysteria. I see it for the defendant with Dr. B., the family physician, or even with a man who, at the suggestion of the attorney, has supplanted the family physician as being more pliable to the attorney's interest. We agree that there is paresis of certain muscles, diminished field of vision, hemi-anesthesia and certain contractures. We agree on the one hand that trauma, or fright without trauma, is an adequate cause for such a condition, and, on the other hand, that the affection is mental in origin and location, and that when the patient can think she is well she will be well save for the weakness consequent to her absence of activity. While agreeing on this, we may differ as to whether such a condition can occur without pre-existing neuropathic basis and also

as to the length of time necessary for recovery; he thinks complete recovery will never take place; I think that it will, that it may be in a month, a year or two years, but, from my knowledge of similar cases, I believe that the termination of litigation will favorably affect it.

The ideal condition would be a joint report to the court, whose witnesses we really are, of our findings. Agreement on facts and certain opinions, disagreement on others. The matters of agreement to go at once to the jury without comment; the matters of disagreement, a question for examination by the attorneys. This I know to be impossible under the present judicial procedure, but without the joint report the result is practically the same. The medical testimony is on a high plane.

On the criminal side I can see no objection to the employment of this plan. If courts of justice are established that justice may be given, certainly in criminal cases there is no room for personal aggrandizement nor of considering the trial a game in which the keenest wit shall win. There is no place for medical advocates, nor for testimony that is not as representative as possible of the best judgment that can be obtained. I fully appreciate, I think, all the practical difficulties that beset the attorney who sets before himself a high ideal of conduct and action; none the less, if a profession means anything in contradistinction from a trade, there are obligations which honorable men, at least, must feel.

In criminal cases where insanity is the defense, opinion more than fact must be relied upon. Hence the opportunity so much seized upon to frame hypothetical questions so that they may be answered in a desired way. Who can doubt that if in a recent case prominently before the public in which the differences of the medical experts' testimony was a matter of public ridicule and professional chagrin, the defendant had been seen by the alienists in the office of one of their number with reference to a diagnosis of his case, no criminal procedure being in existence, there would have been a practical if not an absolute unanimity of opinion in the reports made. In similar cases facts could be agreed upon, and opinions considered in such a way would be found to be much more in accord than has been the fact in the past.

In cases involving examinations by pathologists and chemists there would practically never be important differences. *Post-mortem* findings, examination of suspected or suspicious fluids should but seldom cause difference. Incompetent examination on the one side or the other, you may say, might cause injustice, but this is safeguarded by the fact that under the conditions that we have established there would not be an agreement, since the competent man would certainly never agree to the incompetent findings. In an exceptional case of this sort the jury would weigh the evidence as in every case of disagreement.

I wrote this spring to district attorneys of the state of Massachusetts asking them if in the plan as proposed they could think of any case where the interests of justice would, by it, be endangered. I received the courtesy of a reply from six of them; I abstract briefly some of their opinions:

One district attorney says: "In my opinion the cause of justice would not be injured by the procedure which you outline. This is substantially what I myself have required in several important matters. It seems to me even more important in criminal cases that the exact, honest and true conditions should be made apparent, and that no feeling of personal prestige should permit the employment of experts to carry out a certain theory, as distinguished from the real facts in the case, such as is sometimes shown in civil matters."

Another district attorney says: "I think that so far as the administration of the criminal law is concerned, the plan of procedure which you advocate would have but little practical effect, since the number of cases in which the question of the insanity of a defendant is tried out as a defense is very few. Where there is a real question of the sanity of the defendant the court will appoint alienists under the provisions of Chapter 257 of the Acts of 1904, and my experience has been that attorneys for defendants usually accept their report and do not further contest the question of sanity where the experts find a defendant to be sane."

Another opinion: "I concur heartily with your suggestions. I believe that medical experts, and, in fact, experts in all classes, should act in a judicial capacity and should not be open to the slightest suspicion that they favor either side."

Still another: "It seems to me that you have the right idea. It is a matter of common belief among lawyers, and that belief is usually impressed upon a jury in given cases, that doctors may be had for hire to bolster up any view of a case that the interests of the party concerned requires. I can think of no reason why the procedure that you suggest might not be as effectively used on the criminal side of the court as on the civil side."

Who objects to this plan? On the civil side, some attorneys for the plaintiff, who hope to build up a large case for damages, with no eye, of course, to the contingent fee! On the other hand, some attorneys for the defendants who do not wish to adequately compensate people for injury that they have suffered through the neglect of their clients. This is also objected to by a very small number of specialists whose work is largely that of medical advocates, while, to offset these, men of high standing in special lines most heartily approve of it, while many of the leaders in the ethical progress of the bar have given it their unsolicited and hearty endorsement.

If the time ever comes that the contingent fee is done away with by legal enactment, and a fixed sum determined upon for legal services, when the plaintiff is unable to pay a fair compensation, and a definite sum be established for varying damages, the time of the judicial milennium will be near at hand.

This plan can be carried out in any case. I have been asked, " What do you do when you meet shysters? " I have met shysters on this basis with an ideal result. Honorable men can never find any trouble, I think. In a criminal case a joint examination by experts on each side to be ideal should be secret as to its result until the opinion or opinions were given in court. It is too much to expect this to be accomplished at first, although the plan leaves open, as you see, the opportunity for honest differences of opinion. I doubt, however, if attorneys ever agree to the full consummation of the plan as thus indicated. As far as we can now go is to be honest and open with each other, declining to admit the premise that law is intended to cover crime and wink at injustice, and hence denying the conclusion that our testimony is to support at any cost a stated theory. I now suggest one question most potent to suggest discussion in this society: Where does our duty lie as state officials if other state officials of whom we are in a large sense independent insist that our investigations and conclusions are the property of the state, and we find ourselves forbidden to disclose these to any other physician investigating in the proper interests of defendants? This question has never come to me to decide. I certainly feel, however, that if such constraint was exercised and could be legally enforced, it would be harmful to the interests of justice. I have yet to be convinced that a just cause for the government or for the defense needs concealment.

There are said to be three fundamental principles in the trial of cases. First, that the judge should decide questions of law; second, that the juty should decide questions of fact; third, that the parties shall have the right to introduce all relevant testimony. The plan that I propose to you interferes with none of these principles; moreover, it requires no legislative enactment. The initiative is where it should be, — in the hands of the medical profession. The method has gone beyond the experimental stage.

In conclusion, I urge upon you its adoption, and this I do because, for several years, I have proven its practical usefulness, and many others have done the same, because it elevates medical testimony in the court, interferes with no other plan tending to the same end, requires nothing except its adoption by individuals and societies, and frees the medical profession from all leading strings. The times are ripe.

A GUNSHOT WOUND OF THE HEAD AND A STUDY OF THE BULLET.*

BY CHARLES W. BARTLETT, M.D.,
Associate Medical Examiner, Marshfield, Mass.

On the 11th of December, 1905, about 5 o'clock in the morning, I received a telephone message saying that a prisoner had been shot and had died at the Hingham Police Station, and, as Medical Examiner Spooner was away on his vacation, my services as associate were needed at once.

I took the first train and arrived at the police station at 7.30 A.M.

I found the body of a man about 5 feet 7 inches in height lying on a cot in one of the cells, and was given the following history by the police officer who met me at the station: The prisoner had been drinking heavily all the previous day and, having threatened his wife, she had sworn out a warrant for his arrest.

When the officer arrived at the police station with the prisoner he found the door locked, and while he was unlocking the door the prisoner turned and ran. The officer commanded him to stop and, as he did not do so, fired off his pistol in the air. The prisoner continuing to run, he commanded him a second time to stop, and as he did not, the officer fired his pistol a second time, as he supposed at the ground. At the second shot the prisoner fell forward on his face. When the officer overtook the prisoner he found him bleeding from a wound in the head, from which he died at the police station, where he was taken, five hours afterwards. On my first examination I found multiple wounds of the face, evidently punctured wounds made by falling on the ice. I found also a ragged bullet wound through the skull into the brain. I ordered the body removed to an undertaker's room, where I performed an autopsy at 4.30 that afternoon, assisted by Dr. Gilman Osgood, of Rockland, and Dr. Samuel Spaulding, of Hingham.

Besides the usual appearances after death, there were various abrasions of the skin, showing that this was not his first debauch.

On examination of the wounds of the face we found an irregular and ragged wound of the nose corresponding in length to the nasal bones, and the nasal bones were fractured. There was another wound over the left side of the lower maxillary bone extending to the bone, and still another over the right eye about 1 inch long, also ragged, and several smaller ones about the face.

On examining the scalp we found a penetrating wound $\frac{5}{16}$ inch long a little to the right of the median line and $1\frac{1}{2}$ inches posterior to a line drawn over the scalp from ear to ear; also a penetrating wound $\frac{1}{4}$ inch in diameter situated $1\frac{1}{2}$ inches posterior to the wound just described. A probe passed through one wound emerged from the other. The posterior wound was found to have been made by a bullet, and the anterior was supposed to have been made by a splinter of bone. On removing the scalp a blood clot 3 by 4 inches was found underlying the last two described wounds.

The posterior wound was found to be continuous with an opening in the skull

* Read before the Massachusetts Medico-Legal Society, Oct. 7, 1908.

$\frac{5}{16}$ inch wide by $\frac{1}{2}$ inch in length. This opening was found to be in the right parietal bone $1\frac{1}{2}$ inches superior to the squamous portion of the temporal bone and $3\frac{1}{2}$ inches posterior to the frontal bone. On removing the calvarium the inner table of bone showed greater injury than the outer, the area of its destruction being $\frac{7}{8}$ inch wide by 1 inch long. The dura mater presented a wound $1\frac{1}{2}$ inches long corresponding with the hole in the skull. An examination of the brain showed that the bullet had passed forward and slightly downward through the entire length of the right hemisphere. The wound through the brain easily admitted the index finger and was filled with small pieces of bone. The wound extended to the anterior portion of the right hemisphere, where the bullet made its exit through the first and second frontal convolutions in close proximity to the right orbital plate of the frontal bone, where the bullet was found resting on the orbital plate, which presented a triangular fracture, the base of the triangle being $\frac{1}{2}$ inch in length.

The bullet which passed through the skull and the entire length of the brain was supposed by the police officer to have been fired in the direction of the ground. An examination of the ground where the accident happened was made at my first visit in the morning. I found the ground covered with from 2 to 3 inches of snow and ice, as it had snowed and rained the previous day and then frozen that night. The snow was cut with wheel tracks and frozen into a very rough surface. The distance from the door of the police station to the spot where the prisoner fell, as shown by blood on the ice and snow, was about 240 feet, and the grade about 3 feet rise in 100.

In studying the bullet, there are several things to be considered: The forward motion or velocity of the bullet, the rotation, the heat and impact against the bones of the skull. The initial velocity of a bullet fired from a small revolver is about seven hundred feet per second the bullet making a complete rotation in every 10 or 12 inches in an axis parallel to the line of motion. The heating of the bullet is caused by the ignition of the powder, resistance of the barrel, and the impact of the bullet against the skull, etc. As a result of these several forces we find a certain amount of deformity of the bullet, either breaking it up into an irregular mass or smashing the conical end into more or less of a mushroom appearance. The bullet which I found in the prisoner's head, and which I have presented you for examination, we find broken partly into an irregular mass and partly of a mushroom appearance due to impact against the bones of the skull. We find also on one side a flattened surface crossed longitudinally by six or eight nearly parallel lines, and to the right a similar but smaller surface with a ragged notch in between. Were these surfaces caused by grazing the bones of the skull or from the bullet glancing from the icy roadway as the officer claimed?

Would any marks upon the bullet or any bullet justify a medical examiner in declaring that the bullet had been deflected from some object before reaching the victim?

A POLISH MURDER.*

BY CHARLES A. ATWOOD, M.D.,
Associate Medical Examiner, Taunton, Mass.

SEPT. 22, 1907, the dead body of J. C. was viewed by me at 3.20 A.M. in the rear of 32 Jackson Street. The body, clothed, was lying on back about 12 feet from corner of a bake-shop, in a cow shed. There was a pool of blood at the corner of the bake-shop. An autopsy was performed at 10 A.M. There is a large effusion of blood in the skin the size of the palm of the hand over the left clavicle, slight bruise over the sixth and seventh left ribs, small wound ½ inch in length over right side lower jaw, three wounds below the outer angle of the right eye. There is profuse bleeding from the right ear. There are three cuts or wounds on the back of the head respectively 1, 2 and 3 inches in length. There is extravasated blood beneath the right temporal fascia, dura, arachnoid and pia, and between the convolutions of the brain. There is a compound fracture of the petrous portion of the temporal bone extending into the occipital fossa through posterior fossa into the foramen magnum. The fracture is rendered compound by one of the cuts on the back of the head and right ear. The fourth, fifth and sixth ribs in left axillary line are broken. There is extravasated blood in the anterior mediastinum. Stomach empty; other organs normal. The man died from cerebral injury following fracture of the skull. Around the neck is a strip of cloth with the remains of what may have been a bag. Nothing was found in this piece of cloth.

J. C., a baker, is said to have been a law-abiding citizen, and an honest man. During the day he had attended to his business as usual and nothing was known of the murder until a Pole, who owned the property, 32 Jackson Street, notified the police. This man said he went out to see how his cow was and found the body of J. C. This evening there was a Polish wedding, and a number of people were at 32 Jackson Street, where they were to stop for the night. The police suspected the man, and he, with fourteen other Poles, were carted to the police station. J. C. was known to have a sum of money which he carried in a bag around his neck and which was missing at the time of his death. No weapon was found which could have caused the fatality until a police officer, after several days' hunt, unearthed a small cleaver in the cellar, and the town dog officer, who often finds things, a knife in a neighbor's garden.

My opinion was that death ensued as the result of an attack by a person or persons upon the body of J. C. with a blunt ponderous instru-

* Read before the Massachusetts Medico-Legal Society, Feb. 5, 1908.

ment. The chief of police, after several days, notified me that he had a "find," and submitted a shirt and knife found by dog catcher in neighboring garden, and cleaver. He also stated that through his glass he could see blood on the cleaver. I informed him that I would gladly have Dr. Whitney examine specimens; he demurred, but after some time requested that I do so. Dr. Whitney reported that there was not the slightest evidence of any blood upon any articles submitted for examination. The case came to trial and the assistant district attorney told the police properly that he had no evidence to hold the man.

This case, a Polish murder, does not probably differ much from many other murders among our foreign citizens (in fact, nearly like the classical Chinese murder). The people are clannish and it is very hard to get any evidence.

THE MURDER OF LUDWYK KUBEAK.*

BY HORACE K. FOSTER, M.D.,
Medical Examiner, Peabody, Mass.

THE subject of this report, Ludwyk Kubeak, was a Russian Pole, nineteen years of age, who had lived, as it was reported to me, about one year in the United States, most of that time in Peabody, where he was employed as a laborer in the bleachery.

His employer classed him as a very thrifty, industrious, quiet and frugal young man, always temperate, willing, and ready to do his work well, and often working overtime in order to earn more money — and for that reason was sometimes taunted by his fellow-workmen, and accused of sitting up late at night to count his money.

The first that I had ever seen or heard of the man was on the forenoon of Jan. 11, 1908.

As I was riding along the street on that forenoon, at about ten o'clock, I was hailed by a police officer and asked to go to a field about half a mile away, where some boys had found the dead body of a man, supposed to have been murdered. I drove at once to the designated spot and found an officer in charge of the body and a collection of men, women and children who had gathered from the neighborhood, anxious and eager to see all that could be seen and to hear all that any one might say.

The place where the body lay was just beside a cart path leading back from farm buildings into the fields and pastures in the rear, and on the back side of a small rocky knoll, about twenty or thirty rods back from an area including a part of the farm which had been cut up into streets and was well built over with houses; probably there were nearly or quite one thousand people living within sight and hearing of the place where the body lay.

The body had been found by boys who were skating on a nearby brook, and was soon recognized by some of those who gathered there as that of the young Pole whose name I have given. He had boarded for some months at a house almost in sight of the place where his body lay, with a family, the head of which claimed to be his first cousin.

On Thursday, Jan. 9, he had been at his regular work all day and on Thursday evening was reported to have been at his boarding place writing a letter until about nine o'clock; he then went out to a nearby Polish store where he made some purchases and remained talking for some time and then went back to his boarding place, got some money which belonged to him and again went out alone about ten o'clock in the evening, saying as he went away, "If I don't turn up by midnight look for me at the police station." There was reported to have been a social gathering of some sort that evening at his boarding house, drinking and some carousing, and his cousin, the keeper of the house, said that

* Read before the Massachusetts Medico-Legal Society, Feb. 5, 1908.

Ludwyk left the house to avoid the company and the drinking, as he did not drink at all.

The body when seen by me lay at full length upon the back, arms extended above the head but not resting upon anything, hands clenched. Body was warmly dressed in clean, neat suit and overcoat and light-weight dress vici shoes; had on fleece-lined tan-colored kid gloves and no hat on his head, the gloves, the whole of his face, front of the coat and pants were smeared and spattered with blood. There were no indications of resistance or a struggle, either about his person or upon the ground around where the body lay.

There were two patches of coagulated and frozen blood just at the right of the body as it lay, one corresponding to the location of the head and the other to that of the pelvis; there was estimated to have been a pint or more of blood in the two spots. It would appear as though the body lay face down while the bleeding was going on and was then turned over upon the back as found.

The battered and broken black derby hat lay on the ground on the right side of the body. The clothing was not much disturbed except that the overcoat and under coat were unbuttoned,— all but the upper button,— the front of the pantaloons were cut across by some sharp instrument, the penis was cut off close to the body with some sharp knife apparently with one sweep, and was frozen on to the inside of the hat, the scrotum was cut away, leaving the testicles exposed on all sides, the pieces of scrotal tissue were ground into the dirt and so coated with frozen dust as hardly to be recognized. The body was very rigid and the arms and legs were frozen.

The body was removed to the undertaker's and at three o'clock on the same day, Jan. 11, an autopsy was done which revealed a comminuted fracture of the right side of the skull most marked in the temporal region and at the outer angle of the right eye; at that part of the skull the loose fragments of bone could be easily removed by the fingers. Some of the smaller fragments were embedded in the inner side of the scalp and some were driven into the substance of the brain; there was a large area of infiltration of blood on the right side of the head between the scalp and the skull, and the dura mater was wounded, but there were no clots of any size in the brain substance.

The area of violence could be easily made out on the skin on the right side, and the point of greatest violence was at the outer angle of the right eye.

There was a small punctured wound on the bridge of the nose which would admit closed dressing forceps into the right nostril.

There were no other lesions of importance found upon the body, no finger marks and no abrasions which would indicate any resistance or a struggle.

The heart, lungs, liver, kidneys, spleen, stomach and bowels were all carefully examined and were apparently those of a man in perfect health, the stomach contained a small amount of liquid and no solids. The body measured 5 feet 10 inches, and was estimated to weigh 170 pounds, was well developed and muscular.

He is reported to have kept company with a young Polish girl, seventeen years of age, who lived at a house where the murdered man formerly boarded, but it is said that they had quarreled and had not been seen together during the last two months.

But one of the night police claims to have seen them the Thursday evening in question, at about ten o'clock, walking towards the place of the murder, and another night officer says he saw five foreigners whom he believes to have been Poles going in the same direction, a little later in the evening.

The murdered man was claimed to have worn a belt containing $136 when he left his boarding-house, on Thursday evening, and he also had on a gold hunting case watch in a rubber outside case. Nothing has been found indicating where the money or the belt went to, but the rubber outside case of the watch was found near the body, and the gold watch and chain were found wrapped in a quantity of brown manila wrapping paper, on the sidewalk of the street where he once boarded, about a week after the time of the murder. It lay in plain sight of all who passed on the street and must have been placed there shortly before it was found.

A green birch stick about two feet long and two inches in diameter, with a well-formed handle whittled out on one end, blood stains and hair on the other end, was found by some boys not far from where the body was found. The young girl before mentioned is not under arrest, and three men living in the same house with her have been arrested but allowed to go on account of lack of evidence against them.

The murderer is still at large after a lapse of three weeks, and if long service as medical examiners has developed detective ability in any of the members here present, any suggestions will be gladly received and reported to the state officers and local police who are working to obtain evidence sufficient to arrest and later to convict the guilty party.

THE GAILLOUX MURDER. A CASE SOLELY OF CIRCUMSTANTIAL EVIDENCE, WITH CONVICTION OF THE MURDERER.*

BY WILLIAM F. WHITNEY, M.D., BOSTON.

THE following case presents some unusual points of interest in its medical aspect. Further, a conviction without any direct evidence or any incriminating stains upon the clothes of the defendant shows that circumstances alone, when properly brought together, leave nothing to be asked for in the way of testimony.

At half-past twelve in the morning of March 1, 1908, a police officer on his rounds found the outer door of a small plumber's shop on Hall Street, in Lowell, unlocked. He entered and, upon pushing open the door of a small inner room used as an office, noticed the odor of gas which was escaping from an open burner. He shut it off and then stumbled over the body of a man on the floor, with his head underneath a desk in the space between the two rows of drawers forming the sides. The desk stood in a corner of the room with its back against one wall and with one of its ends against another. In this wall was a window close to the desk. The man lay on his side with his head in a pool of dark blood, estimated from one to two feet in diameter. There were blood spatters on the side of the row of drawers next to his head, but none on the front of them. There were also spatters on the lower part of the adjacent wall of the room, about a foot distant; none, however, higher than twelve or fourteen inches above the floor.

The officer pulled him from beneath the desk, turned him on his back, and, finding that he was dead, summoned aid.

The medical examiner, the late Dr. Irish, was called, who arrived at half past two, about two hours after the body was found. He observed that the body was somewhat warm, that rigor mortis had not set in, and that there were injuries to the head.

At the autopsy, performed about ten o'clock the same morning, it was found that there were two rather irregular linear cuts over the left eye down to the bone, and a deep contused wound with fracture of the skull above the left ear. This was two and one-half inches long by two inches wide by one inch deep, and beneath this the bone was comminuted. The middle meningeal artery was torn and the bleeding had come chiefly from it.

The appearance and shape of the wound rendered it probable that it had been made by a single blow of a heavy rounded or angular instrument. A heavy soldering iron could have made it. No instrument, however, was ever found. It could easily have been thrown into the canal near by.

The face was burned about the lips, chin and inside of the mouth as far back

* Read at a meeting of the Massachusetts Medico-Legal Society, June 15, 1909.

as the tip of the epiglottis with a corrosive substance. The blood on the floor beneath the head was of a peculiar dark tarry appearance and remained semi-solid without clotting.

The problems which at once presented themselves were:

1. To determine the time of death, which, as will be seen later, was of the greatest importance.

2. To determine the nature of the corrosive substance, as a possible clue to the assailant.

The man had evidently been recently killed when first seen at twelve-thirty, and two hours later rigor mortis had not set in. It is to be said here that its commencement was never noted. Assuming the average time for its beginning to be from two to four hours after death, it would place the time of death between half past ten and half-past twelve, the time when he was discovered. This was as near as it could be fixed. The blood beneath his head had not clotted regularly and thus failed to be of any help in determining the time.

A small whiskey glass containing a few drops of a dark fluid stood on a chair in the room. This glass and some of the blood scooped up from the floor were sent to me for examination.

The blood presented an extremely interesting appearance. It was of a dark-brown color, of soft consistency, and moist. Microscopic examination showed perfectly well-preserved blood corpuscles when a little was pressed out under the cover glass. If, however, a little water was added they quickly dissolved, forming a deep-brown fluid. Some of the blood preserved in a tightly corked bottle presented the same characteristics at the time of trial, ten months later. A little of the blood applied to blue litmus paper, previously moistened, turned it a deep red; in other words, giving a marked acid reaction. A little of the blood was rubbed up with water, filtered, a few drops of a solution of barium nitrate added, and a heavy white precipitate formed at once. The same tests were made with the fluid from the glass, with similar results. The substance in the glass was also still moist at the time of trial.

These physical properties and chemical reactions proved that the substance mixed with the blood and in the glass was identical and was sulphuric acid. The same shade and density of color of the fluid in the glass was reproduced on mixing together commercial sulphuric acid and cheap whiskey. The burns about the face and inside of the mouth were, therefore, due to sulphuric acid. It was further probable, from the marked injection of the superficial vessels of the tongue, seen upon microscopic examination, that the acid was taken into the mouth voluntarily, or poured in while the man was unconscious but still alive.

A police officer picked up from the window sill of the room a partly smoked cigarette of a brand known as " The Sweet Caporal All Tobacco Cigarettes."

On the same day (Sunday) Napoleon J. Rivet was arrested on suspicion as he came from Mass. He was the last person known to have been with the deceased, Gailloux, before his death. On the cuff of one sleeve of his coat were two or three minute red stains. These, he explained to the chief of police who questioned him in regard to them, came from a cut on his hand. Of this, however, there was no evidence. These stains were in reality due to acid. But as its character was not satisfactorily determined on account of the small amount, they were not placed in evidence by the prosecution. On searching his coat, there was found a box containing four cigarettes like the one partly smoked found on the window sill.

At the trial it was shown that the deceased had taken out a life insurance policy for one thousand dollars which he had assigned to Rivet. It was claimed by the defense that this assignment was made to cover a loan of five dollars advanced by Rivet to pay the dues on a watch bought on the installment plan by Gailloux. On this policy Rivet had paid the premiums for some time.

Just before the murder the defendant had been employed as a helper in some copper works at Taunton, where he had free access to carboys of sulphuric acid, and also to the vats containing sulphuric acid in which the copper was dipped to clean it. The acid in the vats was of a light-green color from the copper salt left in solution. His landlady saw two bottles, one containing a brown liquid and the other a light-green one, on the shelf of a closet in the room which he occupied in Lowell. These, however, were never found afterward.

Lastly, and most important, was the fixing of Rivet's movements on the previous evening. It was acknowledged that the men had been together about seven o'clock the previous evening, and were to have met again later at a saloon. There was no evidence that they did. One witness testified that she saw Rivet pass her shop, not far distant from the place where the murder was committed, at about twenty minutes past ten going in that direction. His sister showed that he came to her house between twenty and thirty minutes after eleven and passed the night there, and there was nothing in his manner when he came in to arouse suspicion.

Two other circumstances were brought out to which importance was attached by the prosecution.

First, about two weeks before the deceased alleged he had been made very ill after drinking two glasses of whiskey given him by the defendant. His symptoms were severe pain in the stomach and vomiting, lasting

for twenty-four hours. This the government claimed was consistent with sulphuric acid having been given with the whiskey.

Second, that the two men had been found by some boys drinking at the scene of the murder on the Saturday night previous. It was suggested that the murder was contemplated then, but the entrance of the boys prevented its accomplishment. In any case, it showed they were accustomed to go there.

The defense was an alibi, and that the circumstantial evidence was not sufficient to implicate the prisoner.

After a short deliberation the jury returned a verdict of murder in the first degree.

It is impossible in briefly presenting a case to give an adequate picture of the force of the evidence as presented to the jury. One must sit through the trial itself to thoroughly appreciate it. The one important fact was that the defendant was the central figure about which everything was grouped. Not a spark of evidence was introduced to show that there was any one else to be benefited by Gailloux's death. Nor was any one but the defendant associated intimately with him.

As to the circumstances, if taken singly, there is not one that points solely to Rivet. A great many people smoke that peculiar brand of cigarettes. Any one can procure sulphuric acid from a druggist without a prescription, and it does not have to be entered in the poison book. Moreover, there are many other liquids besides sulphuric acid and sulphate of copper that have a brown and green color. All this was ably argued by the defense, but in spite of it, when these facts were all linked together, they formed a chain which unerringly drew the defendant to the electric chair.

The part played by the sulphuric acid in the tragedy is only a matter of conjecture, and probably will never surely be known. One theory is that Rivet intended to get Gailloux drunk, and, when stupid, to give him a dose of sulphuric acid in the hopes that it would eventually kill him. But the victim was not far enough gone to swallow it, and then Rivet, finding himself discovered, dealt the fatal blow. Another theory is that he poured the acid into Gailloux's mouth and over his face after he was struck down, in the hopes that the case would be regarded as suicide, and the blow on the head explained by a fall against the desk.

Whatever the circumstances were, my own opinion is that the acid was introduced when the man was lying where he was found, as otherwise it would be difficult to explain its intimate mixture with the blood which had flowed from the wound in his head.

UNSUSPECTED DIABETES, A CAUSE OF RAPIDLY FATAL COMA.*

BY W. W. MINER, M.D.,
Medical Examiner of Ware, Mass.

I WAS called, as family physician, to the following described case of coma occurring in a woman who was thought to be free from any disease, but which unconscious condition rapidly terminated in death.

K. H., aged forty-one, unmarried, usually employed in domestic service, five feet and eight inches in height and weighing about two hundred and forty pounds. While engaged in washing of laundry clothes at her sister's home, suddenly complained of not feeling well, stopped her work at the washtub, went upstairs to her room and in a few minutes fell into an unconscious condition. This began at about nine o'clock in the forenoon and continued till her death, which occurred about noon, the coma having lasted three and one-half hours. The cause of this fatal attack of coma did not appear evident to me before her death.

She was thought to be in a good condition of health and free from disease. About three months before her death she had given up her position as a domestic in a family where she had served for five years, returning to her sister's home to have a rest, as she was tired of her work. About two months before her death she was in bed for one and one-half days with a tired feeling, had a flushed face, but had no physician and was soon well again. She wanted her sister to get through with her washing early, so took hold of the washing work to help her. When at the tub she suddenly stooped over and said, " Oh, my head, my head." She soon vomited some ham and sliced beets which had been eaten for her breakfast. The pain was in the back part of her head near her neck. She had slight assistance in going upstairs to her room. She talked for a few minutes, saying that she was very sick, but had no pain except in the back part of her neck. Then she fell into an unconscious state, and on my arrival could not swallow.

There was no paralysis or stertorous breathing, her pulse not rapid, respiration comparatively free, no twitching, spasmodic movement or convulsive attacks. There was no edematous condition of her limbs or face. Her complexion was natural, her eyes showed no abnormal action of muscles and the pupils were equal and of medium size; her tongue appeared to fill her mouth, and swallowing was not possible. She had no epileptic seizure. Her heart and arteries were considered sound. Her appetite had been very good but was not considered abnormal. There was no inordinate desire for water or fluids. She did not have to rise at night to evacuate her bladder. Her urine was not known to be abnormal in quantity. Her bowels were regular. She had considerable raising of gas from her stomach, but did not have nausea. She was not subject to at-

* Read before the Massachusetts Medico-Legal Society.

tacks of faintness, pain about her heart or to hard headaches or disturbed vision, except slight want of clearness of sight, but could sew and read well. Her relatives considered her to be free from any disease. Soon after her death I obtained, by use of a catheter, a few ounces of her urine. This was of ordinary color and fairly clear. On using Fehling's test for glucose, I found a heavy precipitate of yellow suboxide of copper, which appeared promptly on boiling and apparently was without a precipitate of albumen. I therefore came to the opinion that her death probably was from diabetic coma and gave a certificate to that effect. She was seen by another physician of experience, whose opinion of the cause of her death coincided with mine.

Osler states that " diabetic coma, first studied by Küssmaul, is the most serious complication of the disease, and carries off a considerable proportion of all cases, particularly in the young. It may occur when diabetes is unsuspected, as in two cases reported by Francis Minot. Frerichs recognizes three groups of cases: 1. Those in which after exertion the patients were suddenly attacked with weakness, syncope, somnolence and gradually deepening unconsciousness, death occurring in a few hours. 2. Cases with preliminary gastric disturbance, such as nausea and vomiting; or some local affection, as pharyngitis, phlegmon or a pulmonary complication. In such cases the attack begins with headache, delirium, great distress and dyspnœa, affecting both inspiration and respiration, a condition called by Küssmaul air-hunger. Cyanosis may or may not be present. If it is, the pulse becomes rapid and weak and the patient gradually sinks into coma, the attack lasting from one to five days. There may be a heavy sweetish odor of the breath due to the presence of acetone. 3. Cases in which, without any previous dyspnœa or distress, the patient is attacked with headache and a feeling of intoxication and rapidly falls into a deep and fatal coma."

Simon, in the recently issued third edition of his work on " Physiological Chemistry," says: " Within the past ten years it has been found that, in a not inconsiderable number of cases of diabetes, degenerative lesions can be demonstrated in the pancreas, and there can be no doubt at the present time that a certain percentage of cases are directly referable to such origin. That the islands of Langerhans are here primarily concerned has been demonstrated by Opie. In this connection Cohnheim's researches are very significant, in which he could show that while neither pancreas nor muscle-splitting tissue contain ferments which are capable of splitting glucose by themselves, extensive glycolysis is effected if an extract of pancreas and muscle plasma, conjointly, are allowed to act upon glucose. A condition thus exists which seems quite analogous to the relation between trypsin and enterokinase.

" In the milder forms of diabetes an insufficiency on the part of the muscle tissue manifestly does not exist, as it is possible to prevent the

occurrence of glycosuria, temporarily at least, if the demand for sugar is increased by abundant muscular exercise. That a hepatogenic diabetes may coexist with a myogenic form, however, cannot be doubted."

The use of sodium bicarbonate solutions by rectal injection, by hypodermoclysis, by lavage or half-teaspoonful doses by the mouth has been proven to be very valuable in the so-called uremic attacks if not connected with diabetes, and, in exceptional instances, of diabetic cases.

Progressive Medicine quotes Bosanquet as saying, in his Goulstonian lecture, that there is sufficient evidence available to establish beyond the possibility of doubt the fact that there is some connection between the pancreas and diabetes.

Prof. T. B. Futcher, of Johns Hopkins University, in his excellent article in the first volume of Osler's " Modern Medicine," gives an interesting and instructive historical account of the contributions which have been made at different times by various skilled laboratory workers to our knowledge of the processes of metabolism and its disturbances in the subjects of diabetes. His article states that " according to Cohnheim's view, the sugar in the blood is burned up in the muscles through the agency of a glycolytic substance which results from the interaction of bodies produced in the pancreas and muscles.

" It is not alone the metabolism of the carbohydrates that is disturbed in diabetes. It is only in the last few years that students of this disease are awakening to the fact that there is also a marked disturbance in fat metabolism. There is now practically conclusive evidence that the power of the tissues to oxidize the fat of the food and body is markedly lowered. In the last five years evidence has gradually accumulated to show that beta-oxybutyric acid and its derivatives, diacetic acid and acetone, arise as the incomplete oxidation of fat. This is the generally accepted view as to their origin at the present time. It will naturally be inferred that in the regulation of the diet of diabetics we must not only consider the carbohydrates, but we must pay more attention to the prescribing of the amount and kind of fat than we have been accustomed to do heretofore.

" Diabetes is sometimes considered among the auto-intoxications. We have no proof that an excess of glucose in the circulating blood is capable of itself of producing any toxic symptoms. Diabetic coma, the most serious complication of the disease, however, is definitely due to an acid auto-intoxication."

" Acetonemia is a toxemia which develops in the terminal stages of diabetes. It is due to an accumulation of acetone in the blood. It is also called diabetic coma. It develops acutely. A sudden onset is attended by sharp pain in the stomach, with nausea and frequently

vomiting. At the same time there is severe dyspnœa. The breathing is irregular and of a panting character, with inspiratory and expiratory dyspnœa. There may or may not be cyanosis. The patient is obliged to sit up in bed on account of the air hunger. Restlessness begins at once; delirium begins within the first hour; in a few hours coma sets in. The temperature is subnormal; the pulse is irregular and soon becomes weak and thready. The odor of acetone is detected in the breath." [1]

The occurrence of diabetic or uræmic coma without being accompanied by other markedly pronounced symptoms I have found mentioned elsewhere.

" Acetonuria is found in states of inanition and in fevers, especially typhoid fever, pneumonia, scarlet fever, measles, acute rheumatic fever, acute miliary tuberculosis and septicæmic conditions, but is much less apt to occur if the dietary allows sugar and starch. It is also found in the cancerous cachexia, especially carcinoma of the stomach; in certain mental and nervous diseases, as in melancholia and locomotor ataxia; in auto-intoxication of intestinal origin; and after chloroform anesthesia. The acetonuria associated with diabetes is of more clinical importance than in these mentioned. The simultaneous finding of glucose and acetone in the urine is good proof of the existence of diabetes, and the larger the amount of acetone, the more severe is the disease." [2]

In Cattell's valuable and useful work on " Post-Mortem Pathology," recently published in Philadelphia, I find the following excellent summary of present knowledge of the pathological findings in diabetes:

" Diabetes mellitus is a constitutional disease characterized by the continued secretion of large amounts of pale cloudy urine, of high specific gravity, containing glucose and, at times, acteone, diacetic acid and beta-oxybutyric acid. It is, as a rule, associated with excessive hunger and thirst, and sometimes with increase in fat, and at other times with progressive emaciation. It occurs most frequently in adult males, Hebrews being especially predisposed. It is due to some failure properly to utilize certain carbohydrates in metabolism. There is a tendency to destructive changes in the tissues and to death from coma. It may be caused experimentally by ingesting phloridzin and by puncture of floor of fourth ventricle. Glycosuria is seen with exophthalmic goiter, certain neuroses, some diseases of the liver, cirrhosis, lesions of the pancreas, injuries to the nervous system, destruction of gray matter in the floor of the fourth ventricle, extirpation of cervical ganglion, pancreatic affections such as calculi, atrophy, carcinoma, necrosis, fatty degeneration, cysts, acute and rarely chronic interlobular pancreatitis. Some

[1] Musser's Physical Diagnosis.
[2] Butler's Diagnostics of Internal Medicine.

cases of the disease show an absolutely healthy pancreas, yet it occurs often with chronic interacinous pancreatitis. Diabetes is closely related to destructive lesions of the islands of Langerhans, especially with hyaline changes and interacinous pancreatitis. In diabetes the number of islands may be diminished and the pancreas be nearly always atrophied. Arterial sclerosis accompanies many cases of diabetes; also, acromegaly may accompany diabetes. It is occasionally associated with tabes. The cœliac ganglion is atrophic in this disease. (Orth.) Neuroretinitis is very common and there may be hemorrhages in the retina and opacities in the vitreous. The most usual change is a thickening and congestion of the membrane. The blood generally appears normal, but contains an increased amount of glycogen and may be loaded with finely divided fat which floats on the surface in a cream-like layer. There may be lipemic clots in the vessels. Fat embolism of the pulmonary vessels has been described. The myocardium is pale and soft; rarely it may be hypertrophied. Advanced fatty degeneration of the muscular fibers is the characteristic change in long-standing cases of diabetes. Croupous pneumonia and bronchopneumonia, chronic interstitial pneumonia and tuberculosis are common complications; many of them terminate in gangrene.

"The lung may soften (malacia) and, becoming mixed with stomach secretions post-mortem, form the so-called *pneumomalacia acida.* It has a sour but not a gangrenous odor. The spleen is usually small, pale and soft, but may be enlarged and congested. Diffuse nephritis with fatty degeneration, and frequently glycogenic degeneration, most marked in the pyramids, may occur. Boils, carbuncles, onychia, eczema and gangrene of the extremities are common. The liver is usually enlarged, often congested, abnormally firm to the touch and gives the glycogen reaction; fatty degeneration is common. Do not mistake diabetes mellitus for alcaptonuria; in the latter disease pigmentation of the cartilages or ochronosis may occur. Some alcaptonuriacs do not show ochronosis, but thus far all the cases of ochronosis exhibit alcaptonuric changes in the urine.

"Established facts concerning diabetes: (1) Considerably more than one half of all cases are due to a destructive disease of the pancreas. (2) When due to disease of the pancreas, injury to the islands is responsible for the disturbance of metabolism in the carbohydrates. (3) Common lesions injuring the islands are chronic interacinous inflammation and hyaline degeneration. (4) Other lesions of the pancreas do not attack the islands of Langerhans, but produce diabetes by destroying the interacinous islands along with the secreting parenchyma. (Opie.) According to the experiments of Sauerback upon guinea-pigs, total extirpation of the pancreas or the tying of its secretory duct gives rise

to atrophy of the islands of Langerhans and the subsequent development of diabetes.

"The Bremer-Williamson reaction of diabetic blood may be obtained a considerable time after death; the procedure is as follows: 40 cmm. of water are placed in a small narrow test tube; to this are added 20 cmm. of blood, 1 cmm. of a 1: 6,000 aqueous solution of methylene blue and 40 cmm. of liquor potassæ. The test tube is placed in water for four minutes, at the end of which time, if the blood is diabetic, the blue color will have disappeared and a dirty green color will have taken its place. Williamson obtained the reaction in 43 cases of diabetes tested and thinks it is due to an increase of glucose in the blood. The reaction is of special value in coma where urine cannot be obtained."

CASE OF POISONING BY MERCURIC BICHLORIDE.*

BY J. WINTHROP SPOONER, M.D.,
Medical Examiner of Hingham, Mass.

MRS. D., aged twenty-one, married, mother of two children, had been through a very trying experience with her husband about two years ago. The husband is now an inmate of one of the state insane hospitals, an incurable. She had at the time of her death recovered from the melancholia of two years ago and was as bright and cheerful as could be expected. As her mother stated, she had had sufficient trouble to lead to suicide, but she had lived it down.

She had been subject to headaches for a long time, and when these were very severe had resorted to headache powders for relief.

On the morning of Nov. 9, 1908, she had been preparing her little daughter to make a visit to the child's aunt. She had complained of headache, and finally told her sister, who was with her, that she must take a headache powder or tablet. She went upstairs with this intention, but was gone so long that the sister sent for her. Mrs. D. came down stairs looking very pale and sick. She said that she had never taken a headache powder which tasted so queerly or made her so sick, and said she must have taken the wrong medicine. Her aunt, who lived next door, was summoned, and she gave her mustard and water. She vomited very soon. She had previously vomited a watery fluid. A second emetic was given, but produced no emesis. Strong coffee was given, which she was unable to swallow. In the meantime the aunt had called the doctors from Hull, Hingham and Cohasset, but could get none of them. She died a little more than an hour after taking the fatal dose.

Autopsy at 9 A.M., Nov. 11, 1908.

Dr. Gilman Osgood, of Rockland, rendered valuable assistance, and Dr. W. H. Sturgis, of Hull, was also present. The stomach and lower part of the esophagus were placed in clean jars, together with sections of the liver, spleen and one kidney, and submitted to Dr. W. F. Whitney for examination.

In the section of the esophagus were found a number of pieces of a white chalky substance, the largest about a quarter of an inch in diameter, which resembled a broken tablet. There was a marked congestion of the lungs, heart, liver, spleen, kidneys and brain, but no structural change. The uterus was functionating.

Dr. Whitney reported that he found sufficient corrosive sublimate to cause death. "From this it appears that she must have taken a corrosive sublimate tablet instead of a headache powder."

A thorough search of the house failed to disclose any tablets or powders or receptacles for the same. Mrs. D.'s aunt said she had some headache powders, which she got on a physician's prescription, and she had at different times given a single powder to her niece, but she had had none for several months. Mrs. D.

* Read before the Massachusetts Medico-Legal Society, Feb. 3, 1909.

last summer worked in a general store at Nantasket where they sold headache powder and various tablets, so that she was in the habit of handling these articles. She was a very careless, heedless person in some respects, childish, as her aunt stated. Considering her character as described, and the absence of any cause for suicide, the cause of death was returned as accidental poisoning by mercuric bichloride.

REPORT OF A CASE OF DEATH FROM H.M.C. ANESTHESIA.*

BY JOHN H. GIFFORD, M.D., FALL RIVER, MASS.

I WAS called on the evening of Aug. 25, 1908, to investigate the cause of death of Mrs. I. L., residing on East Main Street, Fall River. I arrived at 9.15 P.M. The statement of the husband was as follows: The family comprised himself, his wife and three children, aged six years, three years and fourteen months. His wife had menstruated as usual July 6, since which he had no sexual intercourse with her. Up to that date she wore a cervical pessary for preventing conception, introduced by Dr. H. About July 17 she began vomiting and went to consult Dr. C., but he was not at home, so she went elsewhere; he supposed to Dr. H.

She had no discharge prior to this visit, but later flowed one and one-half days, since which time there had been no discharge. Her husband produced some chocolate-coated tablets, apparently an emmenagogue, in the envelope of a local druggist, without written directions. She had taken some of these. He also stated that Dr. H. had introduced the pessary every month to prevent conception. He went with his wife to see Dr. H. Aug. 23. The doctor examined her then, but not in the presence of the husband, and said he would do an operation two days later.

He said he would use morphine, but did not say chloroform. He came home about 3 P.M., Aug. 25, the day appointed for the operation, and found that Dr. H. had already been there and injected morphine, and that his wife was then dizzy. The doctor came half or three quarters of an hour later with a district nurse from the hospital. More morphine was given. Later, he opened the door into the bedroom, where the doctor and nurse were doing the operation and saw a mask tied over his wife's face with a band. Later he saw the doctor blow in her face and begin to do artificial respiration.

Another physician was summoned, who arrived about 5.30. She was dead then.

The arrival of the second physician was opportune for rescuing the attending physician from the angry mob that surrounded and threatened him. Dr. H.'s statement was that he had been in the habit of inserting the pessary, as stated by the husband, but that she had neglected to call for three months past. Since that time he first saw her at his office Aug. 23, 1908, when she gave a history of miscarriage. He made an examination and found a muddy discharge. He then made an appointment for curettage, Aug. 25, at her home under H.M.C. anesthesia.

He had given, Aug. 25, at 1.30 P.M., one tablet 1-100 H., 1-4 M., 1-67 C. by hypodermic injection; the same amount again at 3.30 P.M. He had used a little chloroform on a sponge, not over 1 dr. in all. He had done a brief curettage, when the condition of the patient suddenly became alarming and artificial respiration was done, but without success.

* Read before the Massachusetts Medico-Legal Society, Feb. 3, 1909.

Report of view. — A woman, age twenty-six, white, well developed. Height, 5 feet 4 inches; weight, 130 lb. Lying on her back in bed, markedly cyanotic. Rigor mortis beginning, pupils even and 3 mm. in diameter; two ecchymoses from hypodermic injections in right thigh. Milk present in both breasts. Os uteri patulous and relaxed, perhaps half a pint of blood on the bed near the hips.

In a pan near the bed was water colored with blood, containing also gauze sponges, some clots and membranes.

PATHOLOGICAL REPORT.

BY DRS. A. C. MACRAE AND M. W. MARVELL.

The specimen consists of curettings from the uterine cavity. On examination these curettings are made up of a small piece of translucent pink membrane to which is attached several pieces of spongy, blood-stained tissue.

Microscopical examination. — The sections show a connective tissue rich in blood vessels, degenerating decidual tissue and numerous processes of connective tissue covered by two layers of cells — the *inner* layer with pale-stained nuclei; the *outer*, with *deeply* stained nuclei.

Diagnosis. — Membranes, decidua and chorionic villi.

This case may only serve to confirm the already well-appreciated danger of morphine and hyoscine used as an anesthetic, to which in this instance may have been added that of chloroform. The general looseness, moreover, of the whole proceeding; the securing by the patient of emmenagogue tablets from the druggist; the use by the physician of the cervical pessary; when this had failed of its purpose, his almost too ready resort to curettage and his method of procedure, though they seemed hardly sufficient to warrant bringing criminal proceedings, are all entitled to criticism and condemnation.

A CASE OF WONDERFUL VITALITY.*

BY LEWIS M. PALMER, M.D.,
Medical Examiner of South Framingham, Mass.

I AM reporting the following case, not because it is of any special value as a medical examiner case, but because of its unusual character I think it ought to be on record.

In July last I was called one afternoon by the New York, New Haven & Hartford Railroad to see A. B., who had been injured on the railroad, and was told when I arrived that the accident happened fifteen minutes before my arrival by actual observation. The man lived fifteen minutes after my arrival, making thirty minutes the man survived after being injured.

The man was a tall, powerfully built Frenchman, fifty years of age. He had worked for the railroad many years and for several years in the capacity in which he was then employed, as signal man. He was perfectly conscious and talked with me quietly, telling me how the accident happened. He also asked me if I thought he could get well, showing that he did not realize the severity of his injuries. The remarkable feature of the case is that, with the injuries that he had, he ever breathed again, or was conscious for a single moment.

He gave me the history that he had set a signal for an engine, and then started ahead of it, thinking that the engine was coming on another track, instead of which it followed him, knocking him down, and two wheels passed over the middle of his body.

I found him lying across the tracks, his head and chest outside the rail and his legs and part of his hips inside the rails, his body partly crushed, with his intestines lying loose and scattered over the roadbed and rails. There was only a small amount of hemorrhage to be seen.

Realizing the utter hopelessness of the case, I at once gave him a grain of morphia and watched for the end, expecting every minute that it would be his last.

He only complained of his legs; said there was something on them that was hurting him and begged me to take if off. Thinking a change of position might possibly relieve him, I had him moved, with help, into a different position outside the track. The moving apparently hastened the end, for in a few minutes from the time of the moving he rapidly sank and died.

Careful examination of the body after death showed the liver, stomach, kidneys and intestines one mangled mass of tissues. The spinal column was entirely crushed; also the aorta and its branches. He was not injured in any other place, except that the right hip was crushed and the right testicle was torn from the scrotum. The chest was not injured or opened, neither was the head bruised.

* Read before the Massachusetts Medico-Legal Society, Feb. 3, 1909.

Up to within five minutes of his death he had a fair pulse and a normal respiration, and not so much of a shock as I have seen from a far less serious injury.

From my experience and observation of like cases I should not have expected him to have remained conscious or to have lived more than one or two minutes from the nature of his injuries. I have reported it because it seems to me a vivid illustration of a remarkable vitality.

AN UNUSUAL CASE OF SUICIDE.*

BY A. ELLIOT PAINE, M.D.,
Medical Examiner of Brockton, Mass.

IN the early part of the evening, Nov. 7, 1908, I was called to an adjoining town to view the body of a man fifty-eight years old. He had carried on farming and dealt largely in wood. The son informed me in the summer his father had received an accident which resulted in amputation of the left leg above the knee; since then he had been despondent and attempted suicide, so his mother had watched him closely. After breakfast the deceased told his wife he was going to call on a friend, and as he did not come to dinner she supposed he was with the friend, but at supper time his absence caused her to notify the son, who lived across the street. He, with a hired man, started to find the deceased, when the hired man said when he went to feed the horses at noon time he saw him lying on the hay, as he supposed, asleep. He did not waken him as he was afraid of him. They went to the hay loft and there found the body nearly covered with hay, and sent for me. I had some difficulty in getting up the rude stairs, which were pieces of boards nailed to the studding on the side of the barn, the steps being about eighteen inches apart, then through an opening less than two feet square. I found the head and upper part of the body exposed, the head well covered with dry blood, and rigor mortis well marked, the lower part of the body and legs burrowed under solid hay some two feet deep. Near the body, with light hay covered over them, we found his crutches, with spots of dry blood on them. The body was lowered down through the opening and then we found spots of blood on the steps. On the ground floor a piece of oak about thirty inches long and two inches wide, with sharp, ragged edges, was found with dry blood and some short hairs, corresponding to deceased's hair. As we had only a lantern to see with, I had the body taken to the undertaker's, where I made a full examination. Above the right ear found a crescent-shaped wound three inches long, tearing the scalp upwards; no fracture. Near this wound were several small wounds, none of them going through the scalp; the head and face and both palms covered with dry blood.

From the history of the case and the position of the body I judged this to be a case of suicide, as I could not see how any one or two men could have taken him up in the loft, and the cause of death was probably cerebral hemorrhage. I reported the case to the assistant district attorney, and he ordered an autopsy, which was made on the 10th. The report of the autopsy is as follows:

External appearance. — A well-nourished male, 5 feet 10 inches in height, weighing about 150 lb.; left leg amputated at lower third of femur. Several bruises on right side of head, one being one inch from median line just above the forehead; a slight bruise on outer side of right eye; three inches above the right ear, a crescent-shaped wound three inches long, the scalp turned upwards:

* Read before the Massachusetts Medico-Legal Society, Feb. 3, 1909.

on the under side of the scalp, bruises corresponding to the external ones; over the occipital protuberance a bruise one inch in diameter (none found external), the right temporal muscle filled with fluid blood.

On removing the calvarium, no fracture was found, the dura was deeply engorged, as well as the whole right hemisphere. The blood vessels were softened; no hemorrhage in the brain. The lungs were normal, no adhesions. Normal fluid in pericardium; right heart filled with fluid blood. Valves and structure of heart normal. The stomach contained about one-half pint of dark fluid, which was taken for further examination. The mucous membrane was of a dark-mahogany color. All the abdominal organs were normal.

After finishing the autopsy, a son-in-law gave me a half-pint bottle, the inner side being coated with a green powder. He said he found it in the hay near where the body was found.

The examination of the contents of the stomach showed blood and a large quantity of arsenic. The return of death was arsenical poisoning suicide.

This case was one of great interest to me, showing what severe injuries could be self-inflicted: how, with the aid of his crutches, he had pulled himself up the rude stairs and then taken the Paris green (which was the cause of death); also to learn there had been a case of suicide in nearly every generation, which recalled to my mind that some twenty years ago I viewed the body of his uncle, who hanged himself in his hay loft.

A CASE OF BULLET WOUND. UNUSUAL COMPLICATIONS AND DEATH FOUR MONTHS AFTER THE INJURY.*

Being a Partial Account of the Case of Mass. v. S., 1906, Superior Court, Worcester, Mass.

BY ERNEST L. HUNT, M.D.,

Assistant Pathologist and Surgeon to Out-Patients, Worcester City Hospital, and Associate Medical Examiner of Worcester.

The defendant, Mr. S., was a thrifty working man, but withal of a choleraic disposition. He owned a three-decker house and occupied the lower apartment with his wife, whose temper, also, was none of the mildest. At intervals the pair quarreled, to the annoyance of the tenants of the other two apartments.

On the evening of April 2, 1906, one of these outbursts occurred, and finally Mr. K., who lived on the top floor, sent his boy down the back-way stairs with the request that the pair keep quiet. That merely diverted the wrath of the irate S., who began to abuse the boy. Mr. K. then went down himself and pitched into S., overpowering and pinning him down to the floor of the porch where the altercation had taken place. About this time Mr. F., the tenant of the middle floor, came down and said to K., " He's had enough; let him up," whereupon S. was released. Mr. F. returned to his apartment, got his coat and came down again on his way to his place of business. S. meantime had gone in, seized his revolver and fired a shot at the retreating K. Hearing F.'s step on the stairs, he shouted, " Is that you, F.? " and fired again, the bullet hitting Mr. F., who was on the third stair, in the left thigh.

The police arrived soon after. S. was taken into custody, and the injured man to the City Hospital, where I obtained these facts of his further history.

Mr. F. entered accident-room somewhat weakened by the free hemorrhage which had taken place from the wound. His pulse was but 80 per minute, however, and he was, apart from his wound, in good physical condition, heart and lungs being noted as normal, and the urine, as you see from Chart I, showed no evidence of kidney disease. The wound is thus described: " About 2½ inches below the lower third of Poupart's ligament is a round wound ½ inch in diameter with irregular edges surrounded by an ecchymotic area 1½ inches in diameter. Tissues are swollen about area of wound and for 3 inches down inner side of thigh. . . . On posterior aspect of thigh, at level of the great trochanter, and about 1 inch from cleft of nates, is an ecchymotic area 1½ inches in diameter with a hard movable mass palpable under the skin." This mass corresponded to the position of the bullet, as shown by the x-ray, and next day the bullet was removed by a small incision under cocaine. Gauze drainage was inserted as far as possible into the course of the bullet from both openings.

On the fifth day it was noted: " Posterior wound healing well. *Anterior wound septic*, requiring wick. Ecchymosis down posterior aspect of thigh to

* Read before the Massachusetts Medico-Legal Society, Oct. 6, 1909.

knee. On the ninth day a *tumor* corresponding to the original swelling was discovered, which conveyed a thrill to the palpating hand synchronous with the heart beat."

Thirteenth day. Wound was healing well. Tumor was found to pulsate. Dorsalis pedis arteries pulsated together and no difference appeared in quality of pulse in both feet. Seventh day the posterior wound was entirely and anterior nearly healed.

The diagnosis of *arteriovenous aneurism* was made and operation for its relief undertaken on the twentieth day. The record thus describes the operation:

" Incision 5½ inches long over center of tumor. Careful dissection down to a pulsating mass twice the size of a walnut. This ligated off and a small vessel connecting with femoral artery tied. Venous coats reinforced by silk sutures of the fascia sheath. Considerable bleeding from vein followed cutting away of muscular mass. Bleeding controlled by clamps above and below. Vein itself evidently real source of trouble, its pulsations seemingly transmitted from artery, the latter not being isolated."

Superficial fascia united with catgut and skin with silkworm gut. Dry dressing with pressure.

Stitches were removed on the tenth day after second operation (thirtieth after injury) and the wound found firmly healed. *Two days later the tumor was noted to have recurred with all its former characteristics.*

Patient discharged on fifteenth day after operation (thirty-fifth since injury) in fair general condition.

. . . . . .

Patient reappeared Aug. 10 (four months and eight days after the injury, three months and four days after his discharge) with this history:

Up and walking about, but in poor health and thought to be in consumption until one week ago. Since that time he has been in bed, has had four chills lasting about an hour each, recurring at irregular intervals, the longest interval being two days. Felt mean, feverish and weak, with constant headache. No appetite. Constipated. At first had pain in right chest on deep inspiration.

Had malaria ten years ago.

Has felt strong pulsation over site of injury since left hospital. During past three days a marked swelling has developed, but with little pain.

Physical examination. — General condition poor. Pupils equal and react. Slight yellowish tinge to conjunctivæ. Skin, sallow, dry, hot. There are a few small red purpuric spots on abdomen not disappearing on pressure. Mucous surfaces pale. Tongue, tremulous, with brownish coat. Herpes on lips, which are dry and cracked. Cervical and inguinal glands palpable. Pulse, 100 per minute, regular, fair volume, low tension. Heart, negative. Lungs, resonant throughout. Breathing sounds clear. Abdomen, soft, no tenderness or distention. Spleen and liver not palpable. Fine tremor of extremities. Knee jerks present. No edema of ankles. Distal phalanx of right thumb slightly swollen and tender. There is a red linear scar on anterior aspect of left thigh extending from apex of Scarpa's triagle 4 inches upward along inner border of sartorius. An elongated, oval, pulsating and fluctuant swelling 2½ inches in width extends from near apex of Scarpa's triangle to 1½ inches below Poupart's

ligament. Over it a distinct purring thrill can be felt, and a loud blowing systolic murmur can be heard and traced with diminishing intensity up to Poupart's ligament and down to popliteal space.

Four days later. Patient has been very restless since entrance. On second

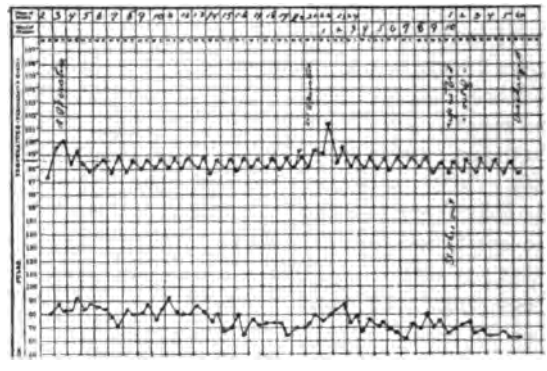

CHART I.

P. J. F. Diagnosis: Gunshot: wound of thigh. Urine, April 3, 1906, normal color; acid; 1,025; no albumin; no sugar.

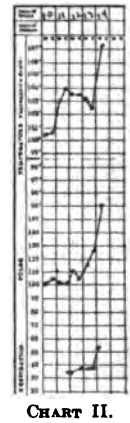

CHART II.

Urine, Aug. 12, 1906: Color, normal; acid, 1,012; slightest possible trace of albumen; no sugar; no casts; many pus and bladder cells.
Blood, Aug. 10: White count, 19,500; Aug. 13, 19,600; Widal, negative.

day developed a mild delirium, persisted in getting out of bed and keeping uncovered. Refused nourishment. Complained of some pain in chest. Grew steadily worse, finally sinking into comatose condition with rapid, labored respiration. No new physical signs, except scattered moist râles in both sides of chest dorsally. Death. (See Chart II.)

REPORT OF AUTOPSY ON BODY OF P. J. F. PERFORMED AUG. 14, 1906.

(Condensed from Worcester City Hospital Records.)

General description of body. — Body is that of a poorly nourished man 6 feet in length and estimated to weigh 110 to 115 lb. Left pupil dilated. Petechiæ ½ mm. in diameter are scattered over neck and sides of abdomen, over dorsum and toes of right foot. There is a one-inch operation scar over left buttock and another on the front of left thigh 4¾ inches long, extending from a point corresponding to junction of middle and inner thirds of Poupart's ligament downward and inward in direction corresponding to the course of the femoral artery in Scarpa's triangle. Under the lower end and a little to the right of this scar is a soft fluctuant swelling 2½ inches in vertical and 2 inches in transverse diameter.

Head. — Pia mater is infiltrated with extravasated blood over left frontal and right parietal region and elsewhere markedly engorged. In the pia over right superior parietal convolution is an irregular whitish, somewhat raised area with pinkish border. On section the cortex immediately underlying this area is also white and opaque to a depth of 5–6 mm. No fracture or other injury to skull.

Thorax. — The left pleural cavity contains 500 ccm. bloody, turbid fluid. Upon pleural surface of lower lobe of left lung posteriorly and at base there is a thin layer of fibrinous exudate. There are a few recent adhesions binding lung to diaphragm, and a firm adhesion near apex. The right pleural cavity contains 60 ccm. of nearly clear fluid. There are firm adhesions at apex and base. Scattered throughout both lungs near the surface are many small, firm nodules dark red in color, slightly bulging above the general surface, circular or irregular in shape, 1.5 to 2 cm. in diameter. On section these nodules are firm, dark red in color, generally of inverted pyramidal shape and associated with a small artery dilated and choked with soft reddish-brown material. Sections from these foci sink in water. Both lungs edematous and lower left lobe increased in density, dark red in color, crepitates but slightly, and sections float submerged but do not sink. Pleural surface over foci described smooth, except on lower left lobe, where there is a general fibrinous exudate.

Heart and pericardium negative save for numerous subpericardial petechiæ.

Abdomen. — General peritoneal cavity free from adhesions and contains small amount of serous fluid. Scattered throughout walls of small intestines are occasional areas ½ to 1 cm. in diameter, usually circular, of a bright red color, which appear to be subperitoneal ecchymoses. Stomach presents numerous submucous ecchymoses near cardiac end. The liver is moderately enlarged, very friable and on section presenting a grayish-yellow mottling. The spleen is enlarged, firm and dark reddish-brown in color, except at the anterior end, where there is a roughly circular area upon its surface 3 cm. in diameter, generally of grayish color with red margins. Section shows this condition to persist through the entire thickness of the organ, but progressively narrowing in cross section. Within the substance of the organ it is well demarked from the surrounding tissue, but there are small whitish nodules scattered about the periphery of the larger one.

The kidneys weigh together 300 gm. The capsules strip readily, leaving sur-

faces roughened by pinhead-sized nodules with white centers and pink margins, slightly elevated and harder than surrounding tissue. On section these penetrate 1 to 2 mm. into cortex and are roughly conical in shape. At about the middle of dorsal surface of right kidney is a similar nodule, but larger, measuring 5–6 mm. in diameter and 6–7 mm. deep.

Adrenals, pancreas and genitalia not abnormal.

Extremities. — Dissection of mass in left leg reveals a large hematoma in the belly of the adductor longus muscle a little larger than a hen's egg, filled with semi-fluid and clotted blood, surrounded by a firm and well-defined wall of fibrous tissue *communicating by irregular rents with both the femoral artery and vein*, that in the latter being at point of junction of profunda femoris. The interior of the vein is roughened by vegetations, and a fairly firm thrombus extending 5 cm. up the vein springs therefrom. Within the hematoma at its upper end is a fine silk suture (about 12 cm. long) attached to scar tissue enveloping the wall of the femoral artery 3 cm. above rent. Both vessels are surrounded, especially in front, by scar tissue.

Bacteriological. — Cultures from heart's blood showed staphylococcus pyogenes (aureus) in pure culture. None were made from organs.

Histological. — (1) *Walls of hematoma:* Muscle fibers, fibrous tissue, pyogenic infiltration and septic thrombus.

(2) *Vein near rent:* Greatly thickened adventitia, erosion of intima with pyogenic infiltration, tiny fibrous vegetations, remains of septic clots.

(3) *Lungs:* Dark-red spots. Alveoli and veins distended with red blood corpuscles. Arteries choked with thrombi. Purulent infiltration and exudation beneath and on pleura.

(4) *Spleen:* Ischemic area with intense round cell and polynuclear invasion, hemorrhagic periphery with thrombosed arteries.

(5) *Liver:* Marked fatty degeneration.

(6) *Kidneys:* Foci of leucocytic invasion around thrombosed arterioles.

(7) *Brain:* Ischemic area with engorged periphery and leucocytic invasion.

Sections stained by Gram-Weigert method show all emboli to consist of colonies of pyococci. Many organisms are seen throughout clot and walls of hematoma and in vegetations of femoral vein.

Anatomical diagnosis. — Laceration of femoral artery and vein from bullet wound. Hematoma with endo- and peri-phlebitis. Multiple infarcts of lungs and kidneys. Infarcts of spleen and brain. Meningeal hemorrhage. Embolic pneumonia and acute pleuritis. Septicopyemia.

. . . . . .

The chief points of forensic interest in this case are as follows:

In presenting it to the court, the prosecution, backed by the opinion of the medical experts, contended that the man died as a direct result of the wound, since if he had not suffered the injury the train of pathological events could not have taken place. The defense opposed to this contention the fact that the clinical diagnosis of pneumonia had been made both before and after the second entry into the hospital, and

endeavored to close the minds of the jury to the distinction between ordinary primary pneumonia and a secondary pneumonia such as here admittedly occurred. Furthermore, the prolonged period of latency or quiescence of the infection was certainly extraordinary, and it was fair to insist upon the fullest demonstration of its possibility and probability in regard to the case in question. Unfortunately, no cultures were taken from the wound in the early part of the illness, but the history of suppuration was presumptive evidence of infection by some pyococcus. Clinical experience of the breaking down and renewal of discharge in old, apparently healed, wounds and sinuses offers parallel instances from which it was safe to deduce the possibility of such latency. Moreover, granting infection of the blood stream to have been from another and more recent source, there still remained the hematoma, a perfect magazine from which rapid-fire volleys of infected clots would be discharged into the general circulation. Hence, it really mattered little whether the pneumonia was the source or the result of the blood infection; the emboli were sure to prove ultimately fatal.

S. was found guilty of manslaughter and sentenced to three years in State Prison.

The writer wishes here to acknowledge the courtesy of Dr. E. H. Trowbridge for use of clinical records, and Assistant District Attorney E. I. Morgan for elucidating certain legal points to him.

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